Vol. 1014 Number 2

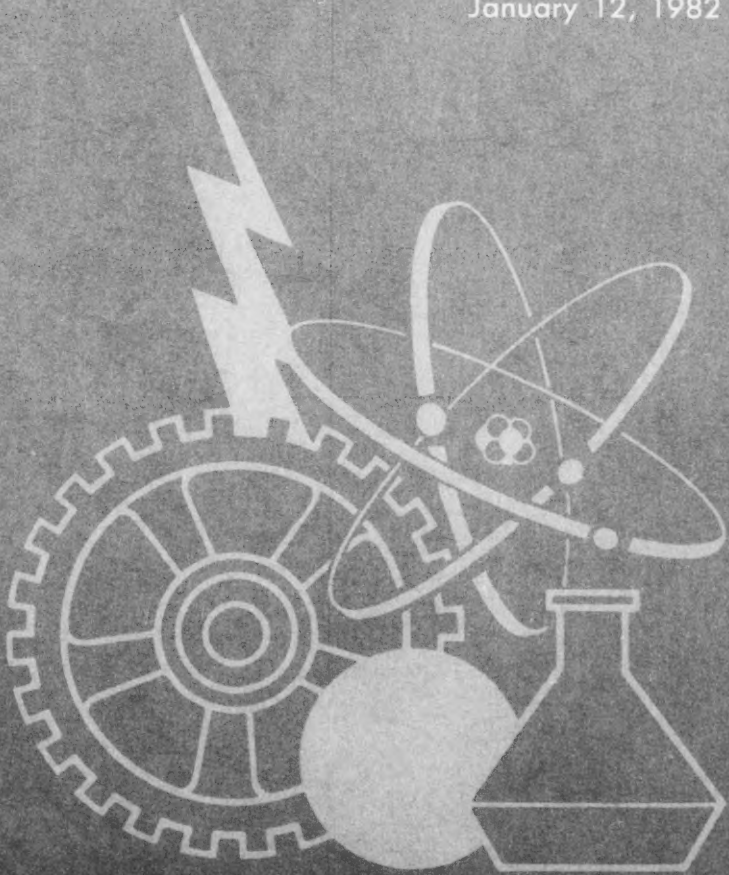
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

January 12, 1982



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

January 12, 1982 Volume 1014 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

Transmittal fee	$ 35.00
Search fee	300.00
International Basic Fee (for the first 30 sheets of an international application)	215.00
Basic Supplemental Fee (for each sheet over 30)	4.00
International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought)	50.00

RENE D. TEGTMEYER,
Assistant Commissioner for Patents.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,895,498, Re. S.N. 265,053, Filed May 19, 1981, Cl. 62/64, APPARATUS AND METHOD FOR COOLING METAL SLABS WITH A UNITARY STRUCTURE FOR DEPOSITING AND GRASPING THE SLABS, Willi Manthey, et al., Owner of Record: *BWG Bergwerk und Walzwerk Maschinenbau, G.M.B.H., Duisburg, Germany,* Attorney or Agent: Karl F. Ross, Ex. Gp.: 344

3,932,355, Re. S.N. 304,883, Filed Sept. 23, 1981, Cl. 526/209, PREPARATION OF SOL CHLOROPRENE POLYMERS, Arthur L. Barney, et al., Owner of Record: *E. I. du Pont de Nemours and Co.*, Wilmington, Del. Attorney or Agent: P. R. Steyermark. Ex. Gp.: 144

3,961,454, Re. S.N. 301,835, Filed Sept. 14, 1981, Cl. 52/527, PREFABRICATED INSULATION PANEL, Howard C. Adams, Owner of Record: *Global Power Co., Waverly, Tenn.,* Attorney or Agent: John B. Hardaway, III, Ex. Gp.: 354

4,008,223, Re. S.N. 298,513, Filed Sept. 1, 1981, Cl. 260/239.3B, NEW 6-Aza-3H-1, 4-BENZODIAZEPINE, Walter von Bebenburg, et al., Owner of Record: *Deutsche Gold-und Silber-Scheideanstalt Vormals Roessler, Frankfurt/Main, Germany,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 121

4,018,656, Re. S.N. 263,223, Filed May 13, 1981, Cl. 203/11, THERMAL SOFTENING AND DISTILLATION BY REGENERATIVE METHOD, Alfred N. Rogers, et al., Owner of Record: *Bechtel International Corp., San Francisco, Calif.,* Attorney or Agent: John L. McGannon, Ex. Gp.: 177

4,147,761, Re. S.N. 297,386, Filed Aug. 28, 1981, Cl. 423/473, HYPOCHLOROUS ACID PROCESS USING SWEEP REACTOR, John A. Wojtowicz, et al., Owner of Record: *Olin Corp., New Haven, Conn.,* Attorney or Agent: None, Ex. Gp.: 113

4,199,244, Re. S.N. 300,994, Filed Sept. 10, 1981, Cl. 354/195, AUTOMATIC FOCUSING CAMERA, Edwin K. Shenk, Owner of Record: *Polaroid Corp., Cambridge, Mass.,* Attorney or Agent: David R. Thornton, Ex. Gp.: 211

4,199,287, Re. S.N. 310,641, Filed Oct. 13, 1981, Cl. 414/68, METHOD AND APPARATUS FOR STACKING BLOCK-LIKE ARTICLES, Thomas R. Salts, Owner of Record: *Besser Industries, Inc., Roanoke, Ill.,* Attorney or Agent: John F. Learman, et al., Ex. Gp.: 314

4,228,265, Re. S.N. 304,788, Filed Sept. 23, 1981, Cl. 526/230, PROCESS FOR PRODUCING SULFUR-CURABLE ACRYLIC RUBBERS, Tetsu Ohishi, et al., Owner of Record: *Nippon Zeon Co., Ltd., Tokyo, Japan,* Attorney or Agent: Leonard W. Sherman, et al., Ex. Gp.: 144

4,236,628, Re. S.N. 317,471, Filed Nov. 2, 1981, Cl. 198/525, CONVEYOR SKIRT BOARD AND HOLDER, Richard P. Stahura, Owner of Record: *Martin Engineering Co., Neponset, Ill.,* Attorney or Agent: Thomas F. McWilliams, et al., Ex. Gp.: 313

4,247,177, Re. S.N. 315,189, Filed Oct. 26, 1981, Cl. 351/44, 3D MULTICHROME FILTERS FOR SPECTACLE FRAMES, Alvin M. Marks, et al., Owner of Record: *Inventors,* Attorney or Agent: Anthony H. Handal, et al., Ex. Gp.: 257

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,865,678, Reexam. No. 90/000,123, Requested: Dec. 10, 1981, Cl. 428/91, SUEDE-LIKE RAISED WOVEN FABRIC AND PROCESS FOR THE PREPARATION THEREOF, Miyoshi Okamoto, et al., Owner of Record: *Toray Industries, Inc., Tokyo, Japan,* Attorney or Agent: Austin R. Miller, Ex. Gp.: 164, Requester: Toray Industries, Inc., Philadelphia, Pa.

3,892,984, Reexam. No. 90/000,124, Requested: Dec. 14, 1981, Cl. 307/530, REGENERATING CIRCUIT IN THE FORM OF A KEYED FLIP-FLOP, Karl-Ulrich Stein, Owner of Record: *Siemens Aktiengesellschaft, Berlin & Munich, Germany,* Attorney or Agent: Hill, et al., Ex. Gp.: 254, Requester: Mostek Corp., Carrollton, Tex.

PATENT NOTICES

Certificates of Correction for the Week of Jan. 12, 1982

Re. 30,592	4,253,007	4,281,684	4,289,126
Re. 30,776	4,259,306	4,282,320	4,289,318
3,882,887	4,262,087	4,283,121	4,289,373
4,073,669	4,265,366	4,283,137	4,289,898
4,134,797	4,267,219	4,283,348	4,290,476
4,165,210	4,272,635	4,283,376	4,290,695
4,165,330	4,272,639	4,283,846	4,290,810
4,166,097	4,273,186	4,283,901	4,292,645
4,195,638	4,273,795	4,284,007	4,293,379
4,198,168	4,273,856	4,284,019	4,294,698
4,209,500	4,274,878	4,284,225	4,294,890
4,213,461	4,274,923	4,284,300	4,295,040
4,213,589	4,275,199	4,284,523	4,295,206
4,232,159	4,275,287	4,284,530	4,296,339
4,235,990	4,275,744	4,285,569	4,296,587
4,242,513	4,276,974	4,286,590	4,296,601
4,246,547	4,277,595	4,286,645	4,296,649
4,247,545	4,277,655	4,287,127	4,296,853
4,247,671	4,278,763	4,287,793	4,297,115
4,249,517	4,280,099	4,287,923	4,297,351
4,250,007	4,280,560	4,288,410	4,297,929
4,250,751	4,280,614	4,288,664	4,298,860
4,251,482	4,281,039	4,288,684	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 222
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6552
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF November 28, 1981

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-23-80
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-06-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	9-15-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-14-80
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-17-80
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-08-80
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	6-11-80
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—VACANT ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-06-80
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-07-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-06-79
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	3-14-80
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	4-23-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—M. M. NEWMAN, Director ... Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	6-04-80
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	3-17-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-22-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during November 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,154,787 to 3,158,866, inclusive

Plant Patents ..... Numbers 2451 to 2454, inclusive

REISSUES

JANUARY 12, 1982

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

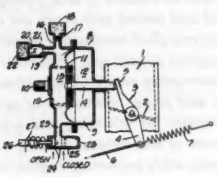
Re. 30,844
RUN-ON PREVENTION DEVICE FOR INTERNAL COMBUSTION ENGINES

Shizuo Yagi, Asaka, and Minoru Atsumi, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Original No. 3,805,760, dated Apr. 23, 1974, Ser. No. 309,745, Nov. 27, 1972. Application for reissue Nov. 13, 1975, Ser. No. 631,657

Int. Cl.³ F02B *77/00*

U.S. Cl. 123—198 DB **9 Claims**



1. A run-on preventing device for a fuel component duct of an internal combustion engine, the duct having a throttle valve, [a lever arm for controlling movement of the throttle valve,] a throttle control line for opening the throttle valve, *a lever arm for controlling movement of the throttle valve,* and a closing spring opposing the throttle control line to close the throttle valve, the run-on preventing device comprising: a housing means; a diaphragm dividing the housing means into a vented chamber and a control chamber; a pin extending between the diaphragm and the lever arm; a spring backing the diaphragm for maintaining the pin in contact with the lever arm; a restricted outlet from the control chamber tending to delay closing of the throttle valve in response to the closing spring; a check valve to admit air to the control chamber when the control chamber expands; a bleed valve; a spring *positioned within said control chamber* normally holding the bleed valve in its open position exposing the control chamber to atmospheric pressure; a solenoid control operable, when energized, to hold the bleed valve in its closed position, and operable, when de-energized, to permit the bleed valve spring to open the bleed valve; and an ignition switch having a closed position energizing the solenoid control to close the bleed valve in an off position de-energizing the solenoid control to open the bleed valve thereby to free the diaphragm for movement with the throttle valve to effect immediate closure in response to the closure spring.

Re. 30,845
APPARATUS FOR AUTOMATICALLY MEASURING THE LIGHT TRANSMISSION FACTOR OR LIQUID TEST SAMPLES

Michel Ossona de Mendez, Montlhery; Michel J. Dupuy, Livry-Gargan; Roland Charreton, Paris, and Albert Foucard, Gagny, all of France, assignors to Roussel-Uclaf, Romainville, France

Original No. 3,829,221, dated Aug. 13, 1974, Ser. No. 335,890, Feb. 26, 1973. Application for reissue Dec. 20, 1978, Ser. No. 971,563

Claims priority, application France, Feb. 29, 1972, 72.6802

Int. Cl.³ G01N *21/13;* **G01J** *3/42*

U.S. Cl. 356—440 **35 Claims**

1. An apparatus for measuring a series of liquid test samples for their light transmission characteristics comprising:

a. a stationary circular apparatus frame,

b. a plurality of measuring vats disposed on said apparatus frame,

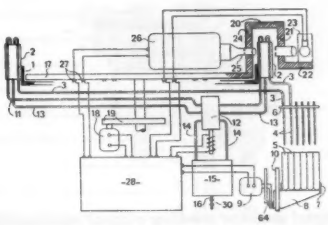
c. a light source,

d. light detecting means,

e. means for supporting said light detecting means and said light source in alignment, [and] *said supporting means comprising:*

i. a rotary platform journaled in the vertical central axis of said stationary apparatus frame,

ii. said rotary platform having means for aligning said light source and said light detecting means, said measuring vats positioned between said light source and said light detecting means for measuring the light transmission characteristics of said vats during rotation of said platform, and



iii. said aligning means directly connecting said light source and said light detecting means to said rotary platform in fixed, spaced-apart relationship with respect to one another, and

f. [means for moving said supporting means relative to said measuring vats, said measuring vats positioned between said light source and said light detecting means for measuring the light transmission characteristics of said vats] *means for rotating said platform relative to said apparatus frame during measurement of said light transmission characteristics.*

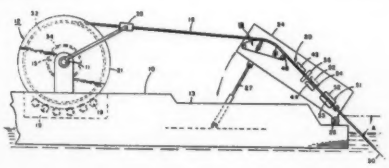
Re. 30,846
SUBMARINE PIPELINE LAYING VESSEL

Alexander C. Lang, Henly on Thames, England, and Peter A. Lunde, Houston, Tex., assignors to Santa Fe International Corporation, Orange, Calif.

Original No. 3,982,402, dated Sep. 28, 1976, Ser. No. 574,433, May 5, 1975. Application for reissue Sep. 22, 1978, Ser. No. 944,979

Int. Cl.³ F16L *1/00;* **B63B** *35/04;* **B65H** *75/00*

U.S. Cl. 405—168 **25 Claims**



1. A vessel for continuously laying a pipeline on the bed underlying a body of water, comprising:

a pipe supply reel mounted for rotation on said vessel about [its horizontal] *a predetermined* axis;

drive means for rotating said reel [thereby unwinding a pipe section];

a diverter structure having one end coupled to one end of said vessel and having the other end extending upwardly in the direction of said reel and at an acute angle relative to the deck of said vessel; and pipe-conditioning means mounted on said diverter structure for conditioning said pipe section and discharging the conditioned pipe section into said body of water.

Re. 30,847

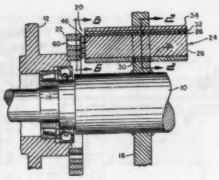
TUBULAR WHEEL SPEED SENSOR

Thomas A. Gee, Allen Park, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Original No. 3,938,112, dated Feb. 10, 1976, Ser. No. 460,325, Apr. 12, 1974. Application for reissue Nov. 30, 1977, Ser. No. 855,816

Int. Cl.[3] H02K *21/38*; G08C *19/12*

U.S. Cl. 310—168 14 Claims



13. A signal generator providing a signal representative of the angular velocity of a rotating body, said signal generator comprising a rotor connected to and rotatable with said body, said rotor being of ferromagnetic material and having at least one array of magnetic field interrupting means on the outer periphery thereof, sensing means mounted proximate to said rotor establishing an air gap therebetween, said sensing means including a magnetic flux source, means for producing a split magnetic flux path, and coil means, said split magnetic flux path producing means including first and second pole pieces positioned relative to said magnetic flux source so as to be parallel to and equidistant from said magnetic flux source, said sensing means being retained by retaining means in a tubular housing permitting axial and angular movement of said tubular housing and said sensing means retained thereby when proper orientation of said sensing means is being established for different rotor sizes and/or spacings of magnetic field interrupting means, said tubular housing being parallel to the axis of said body and spaced a predetermined distance from said axis, said proper orientation of said sensing means occuring when said first and said second pole pieces are alternatively in register with said magnetic field interrupting means in said rotor resulting in the interruption of said split magnetic flux path by said magnetic field interrupting means when said rotor is rotated causing a flux change, said proper orientation of said sensing means being retained by means for mounting said sensing means permitting axial movement of said tubular housing and said sensing means retained thereby while preventing angular movement of said tubular housing after said proper orientation of said sensing means is established, said axial movement being limited by gauging means adjacent said rotor, said coil means being responsive to said flux change to produce an output signal, said coil means being minimally responsive to any flux change resulting from relative axial movement between said sensing means and said rotor.

PATENTS

GRANTED JAN. 12, 1982

ERRATA

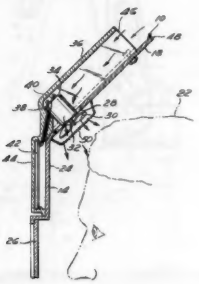
For CLASS	See PATENT NO.
062–517	4,309,872
413–018	4,309,951
413–012	4,309,952
086–001	4,310,324
083–001	4,310,325
501–015	4,310,357
376–280	4,310,385
424–263	4,310,589
424–270	4,310,590
435–146	4,310,635
556–451	4,310,678
556–462	4,310,679
556–467	4,310,680

PATENTS

GRANTED JANUARY 12, 1982

GENERAL AND MECHANICAL

4,309,774
VENTILATING HELMET
Chester D. Guzowski, 291 Sequoia Ct., #11, Thousand Oaks, Calif. 91360
Continuation-in-part of Ser. No. 50,655, Jun. 21, 1979, abandoned. This application Sep. 2, 1980, Ser. No. 182,962
Int. Cl.³ A61F *9/06*
U.S. Cl. 2—8 **3 Claims**



1. In combination with a welding helmet, said helmet being formed of a thin sheet material wall member, said wall member having a front surface, said front surface including a window, said helmet including an internal chamber, said internal chamber adapted to receive a person's head with that person being able to observe through said window, the improvement comprising:

an opening formed through said wall member connecting with said internal chamber, a fan blade located within said opening adapted to move air into said internal chamber, said fan blade being electrically operated, an electrical battery source mounted on said front surface of said wall member, said electrical battery source connected to operate said fan blade, said electrical battery source comprising a light sensitive cell, said cell to produce electrical energy to operate said fan blade upon sensing a satisfactory level of light energy such as from a welding arc; and

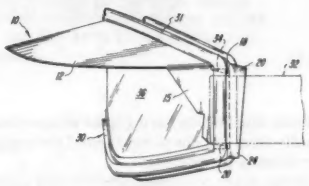
said fan blade being mounted within a housing, said housing including a hollow tubular extension, said extension terminating in an access opening into said ambient, said extension being mounted on the exterior surface of said wall member, said access opening being displaced from said front surface of said wall member and located adjacent the back edges of said wall member, said light sensitive cell being mounted on said housing, whereby said housing can be readily adapted to existing helmet structures with a minimum amount of modification.

4,309,775
VISOR FOR GOGGLES AND METHOD OF ATTACHMENT
Robert L. Jory, 8525 W. 55th Dr., Arvada, Colo. 80004
Continuation-in-part of Ser. No. 94,519, Nov. 15, 1979, abandoned. This application Aug. 25, 1980, Ser. No. 181,266
Int. Cl.³ A61F *9/02, 9/04*
U.S. Cl. 2—12 **6 Claims**

1. A visor member adapted to be secured to goggles including a lens, a rim supporting the lens and having elongated openings defined therethrough on opposite sides thereof and extending through the rim in a direction substantially transverse to the lens, and an elastic headband attached to the rim at the ends of the headband at the openings in the rim, the visor member comprising:

a brim portion having a front edge and a rear edge, the rear edge being configured to complementarily engage the upper portion of the goggles; and

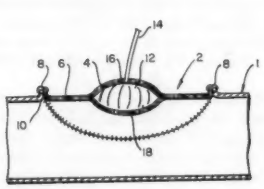
opposed visor member end mounting sections extending from the sides of the brim portion in a direction substantially perpendicular thereto, the end sections including upper and lower notches defined therein and delineating upper and lower mounting tabs, the dimension of the mounting tabs being greater than the largest dimension of



the goggle rim elongated openings whereby the mounting tab may bear upon the rear upper and lower edges of the openings to securely mount the visor member to the goggles;

whereby the visor member may be secured to the goggles by engaging the rear edge of the brim portion at the upper portion of the goggles, and tensioning the brim portion thereagainst by means of the end mounting sections engaged in the openings of the goggle.

4,309,776
INTRAVASCULAR IMPLANTATION DEVICE AND METHOD OF USING THE SAME
Ramon Berguer, 5865 Bloomfield Glens, West Bloomfield, Mich. 48033
Filed May 13, 1980, Ser. No. 149,484
Int. Cl.³ A61F *1/00, 1/24;* A61M *5/00*
U.S. Cl. 3—1 **15 Claims**



1. An intravascular device having a chamber for containing transplanted cells and having outwardly extending peripheral flange means designed and shaped for suturing in an opening made in the wall of a blood vessel with a porous chamber-forming wall thereof providing an interface between the cells in the chamber and the blood in the vessel, said porous chamber-forming wall having a pore size permitting continuous diffusion of hormonal components therethrough but blocking the diffusion of cells.

4,309,777
ARTIFICIAL INTERVERTEBRAL DISC
Arun A. Patil, 1011 Valley View Dr., Minot, N. Dak. 58701
Filed Nov. 13, 1980, Ser. No. 206,564
Int. Cl.³ A61F *1/24*
U.S. Cl. 3—1.91 **6 Claims**

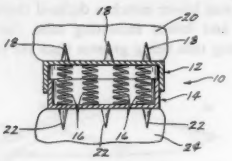
1. An artificial intervertebral disc for implantations in the

disc space after the removal of a diseased or damaged cervical intervertebral disc, comprising,

an upper disc portion,

a lower disc portion mounted on said upper disc portion,

said upper disc portion having spike means extending upwardly from the upper end thereof for engagement with the vertebra thereabove,



said lower disc portion having spike means extending downwardly from the lower end thereof for engagement with the vertebra therebelow,

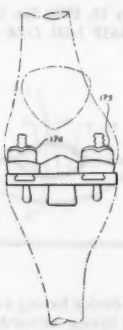
and spring means positioned between said upper and lower disc portion yieldably urging said disc portions away from each other.

4,309,778

NEW JERSEY MENISCAL BEARING KNEE REPLACEMENT

Frederick F. Buechel, and Michael J. Pappas, both of Irvington, N.J., assignors to Biomedical Engineering Corp., Newark, N.J.

Filed Jul. 2, 1979, Ser. No. 53,694
Int. Cl.³ A61F *1/03*
U.S. Cl. 3—1.911 **48 Claims**



1. An improved prosthetic joint of the type including:

(a) tibial platform means having a first superior bearing surface, the tibial platform means for replacing tibial portions of a knee;

(b) bearing insert means having a first inferior bearing surface which slidably engages the first superior bearing surface of the tibial platform means for sliding movement relative thereto during joint articulation, the bearing insert means for providing an articulated joint between the tibial platform means and femoral portions of the knee;

wherein the improvement comprises:

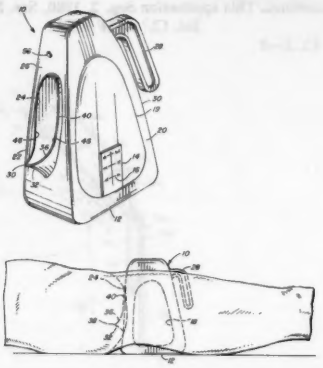
(c) means for constraining motion of the bearing insert means during joint articulation to a predetermined path relative to the tibial platform means.

4,309,779

PERSONAL URINAL DEVICE USEABLE BY MALES AND FEMALES

Leland W. Knight, Tempe, Ariz., assignor to Paul W. Reichert, Phoenix, Ariz.

Filed Sep. 24, 1980, Ser. No. 190,226
Int. Cl.³ A47C *19/06*
U.S. Cl. 4—144.3 **22 Claims**



1. A personal urinal adapted for collecting urine from either a male or a female, said urinal comprising in combination:

(a) a housing for collecting the urine;

(b) means for manipulating said urinal into place for use;

(c) an opening disposed in said housing for ingress of urine;

(d) said opening including an edge defining the bottom and sides of said opening, said edge being configured to form a seal with the flesh extending upwardly from the vaginal opening and along either side of the labia majora to a point beyond the urethra on placement of said housing in position for use by a female; and

(e) said opening further including a spout defining a segment of said edge and having an interior downwardly sloping surface for supporting the penis on placement of said housing in position for use by a male;

whereby, said urinal is useable effectively and without urine seepage by either males or females.

4,309,780

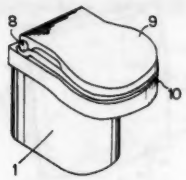
TOILET SEAT AND COVER THEREFOR

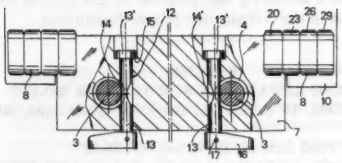
Giuseppe Fantetti, Brescia, Italy, assignor to I.C.S. Cidneo S.p.A., Barletta, Italy

Filed Mar. 19, 1980, Ser. No. 131,707
Claims priority, application Italy, Oct. 11, 1979, 5232 A/79
Int. Cl.³ A47K *13/00*
U.S. Cl. 4—234 **7 Claims**

1. A toilet seat and cover therefor, particularly for use with a toilet bowl having a pair of vertically oriented clearance holes in its rear, upper part, said toilet seat being pivotably connected to the cover therefor, said toilet seat and cover assembly comprising: a supporting plate pivotably attached to said toilet seat and said seat cover and having a pair of horizontal openings therein; a pair of vertically oriented apertures in said supporting plate; a pair of anchoring means positioned in said vertically oriented apertures; a pair of locking pins mounted and guided in said horizontal openings in said supporting plates, said locking pins intersecting said apertures of

said supporting plate; an intermediate portion in each of said locking pins for engaging and disengaging said anchoring





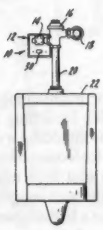
means upon rotation by 180 degrees in one direction and in the opposite direction, respectively, of said locking pins.

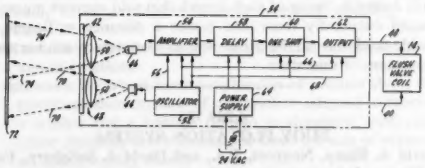
4,309,781

AUTOMATIC FLUSHING SYSTEM

Frederic Lissau, Chicago, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.

Filed May 9, 1980, Ser. No. 148,402
Int. Cl.³ E03D *13/00*
U.S. Cl. 4—304 **5 Claims**





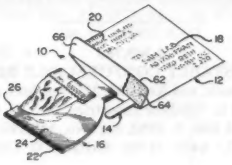
1. An automatic flushing system comprising:
an electrically operated flush valve;
a control box;
a light source mounted in said control box;
a photosensor mounted in said control box adjacent said light source;
a lens system located in said control box, said lens system comprising spaced convex lenses, one positioned in front of said light source and one positioned in front of said photosensor, said lenses being arranged to focus on said photosensor only light from said light source reflected from an object operatively adjacent said light source;
a cover plate for said control box, said cover plate having an opening therein in register with said lenses;
a control circuit in said control box responsive to said photosensor and connected to said flush valve for initiating operation of said flush valve;
said control circuit including a time delay which inhibits operations of the flush valve until reflected light is sensed by said photosensor for a preselected time period.

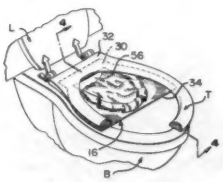
4,309,782

DEVICE FOR COLLECTING FECAL SPECIMENS

Esteban Paulin, 5 Guerrero, Queretaro, Mexico

Filed Sep. 11, 1980, Ser. No. 186,348
Int. Cl.³ A47K *17/00*; E03D *13/00*
U.S. Cl. 4—661 **11 Claims**





1. A specimen collector for use in association with a toilet bowl comprising:
a flat base element of size and shape as to effectively overlie the rear portion of the toilet bowl when in a normal operative position thereon for receiving the whole specimen discharged into the toilet bowl opening;
said base element including a linear forward margin for defining a substantial forward opening with the toilet bowl and to permit ready urinal discharge into the toilet bowl without intermixing with the specimen being discharged;
said base element including a rear portion for engagement beneath a toilet seat on the toilet seat for stabilizing the collector when a specimen is being discharged therein;
said base element including a central portion defining a central through opening of sufficient diameter to be positioned beneath the rectum of one discharging the specimen;
a collection bag secured to said base element and depending beneath and completely underlying the central through opening for catching the specimen being discharged; and
said collection bag including a free rear margin disposed beneath the under-surface of said base element for permitting specimen-excess to be scraped therethrough and discharged into the toilet bowl.

11. In combination, a specimen collector for use in association with a toilet bowl, said specimen collector comprising:
a flat base element of size and shape as to effectively overlie the rear portion of the toilet bowl when in a normal operative position thereon for receiving the whole specimen discharged into the toilet bowl opening;
said base element including a linear forward margin for defining a substantial forward opening with the toilet bowl and to permit ready urinal-discharge into the toilet bowl without intermixing with the specimen being discharged;

said base element including a rear portion for engagement beneath a toilet seat on the toilet seat for stabilizing the collector when a specimen is being discharged therein;

said base element including a central portion defining a central through opening of sufficient diameter to position beneath the rectum of one discharging the specimen;

a collection bag secured to said base element and depending beneath and completely underlying the central through opening for catching the specimen being discharged, said collection bag comprising a foldable material, said base element including a fold-line extending through said linear margin and the rear portion of the element for defining two foldable and juxtapositionable halves for being folded during both before and after a specimen is collected; and

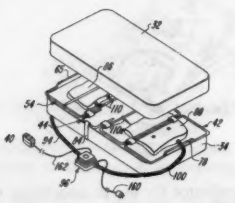
a mailer envelope having a sealable closure for packaging said specimen collector before use, said mailer envelope being of a material to protect the integrity of the specimen being collected, said specimen collector being sealingly received in said mailer envelope after collection.

4,309,783

ADJUSTABLY CONFORMABLE BED

Michael A. Cammack, and Keith M. Mullins, both of Ft. Collins, Colo., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed Feb. 6, 1980, Ser. No. 119,193
Int. Cl.³ A47C *21/06*; A61G *7/00, 7/06*
U.S. Cl. 5—508 **32 Claims**



1. For use with a flexible pad which overlies a supporting substrate and includes a feature of flexural adjustability of said pad to a plurality of different positions, the improvement comprising:

an inflatable bag shaped to be positioned between said pad and said substrate;

means for inflating said bag;

at least one elongated flexible element secured with respect to said bag and of a specific length which limits and defines contour of said bag upon inflation thereof;

a frame assembly disposed between said bag and said pad and including a plurality of sections hinged together to permit spatial inclination of one section relative to another;

and means for effectively securing said element to at least one of said sections interiorly of said assembly.

4,309,784

PILLOW-DISPLAY CASE

Patrice Cohen, 100-5 DeKruif Pl., Bronx, N.Y. 10475

Filed Jun. 9, 1980, Ser. No. 157,560
Int. Cl.³ A47G *9/00*
U.S. Cl. 5—442 **4 Claims**

1. Combination pillow-display case for housing and displaying a variety of objects wherein the pillow is of conventional construction comprising a front face panel, the peripheral edges of which are connected to the peripheral edges of a rear face panel, enclosing therebetween suitable pillow-stuffing material, which comprises:

transparent flexible overlay sheet means substantially coextensive with at least one face panel of the pillow, the peripheral edges of said overlay sheet means being attached to the pillow so that at least one normally closed display space is formed between said overlay sheet means and the face panel of the pillow which said overlay sheet means overlays; and

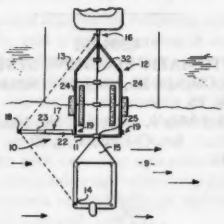
reclosable display space access means for opening said normally closed display space to permit the insertion, arrangement, mounting and removal of the objects to be displayed in the combination pillow-display case.

4,309,785

ALIGNING APPARATUS FOR TRAILER BOATS

Edward J. Budd, 19 Prince St., Brighton, Queensland, 4017, Australia

Filed Oct. 19, 1979, Ser. No. 86,527
Claims priority, application Australia, Oct. 19, 1978, PD6461
Int. Cl.³ B63B *21/64*
U.S. Cl. 9—1.2 **9 Claims**



1. Aligning apparatus for maintaining a boat in operative relationship to a trailer during launching and retrieving operations, said aligning apparatus including a strut assembly having locating means at one end for connection to said trailer in an operative manner in which said strut assembly extends transversely away from said trailer and support means at the other end of said strut assembly for a line adapted to extend from said support means to the stern of the boat and said line passing forwardly to a position adjacent the front of the trailer and said strut assembly being of such length that said support means is spaced outwardly from said trailer a distance sufficient to enable said line to be tensioned to counteract athwartship movement of said stern.

4,309,786

BUOY FLOTATION SYSTEM

David A. Sharp, Newport, R.I., and David J. Salisbury, Fort Wayne, Ind., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 12, 1979, Ser. No. 84,250
Int. Cl.³ B63B *51/02*
U.S. Cl. 9—8 R **7 Claims**

1. A flotation system for a buoy comprising:

a float;

a container enclosing a fluid for inflating said float;

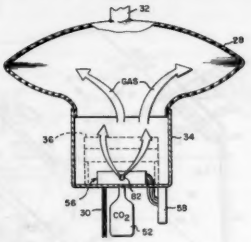
a chamber connecting said container with said float;

a cutter located within said chamber, said cutter having a cutting edge, a portion of said container extending into said chamber adjacent said cutting edge;

means including an explosive charge for activating said

cutter, upon deployment of said buoy, to sever said portion from said container for releasing the fluid enclosed in said container; and

said cutter comprises a piston for driving said cutting edge, said piston slidably mating with a wall of said chamber,



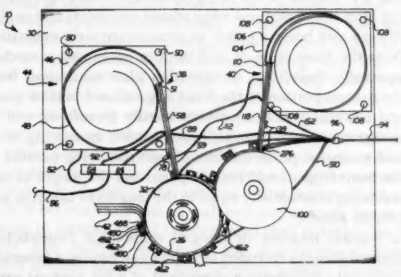
said portion of said container extending past the surface of said wall via an aperture in said wall, said piston being adapted to admit a flow of said fluid from said container to said float subsequent to severing said container portion in response to activation of said cutter by said explosive charge.

4,309,787

METHODS AND APPARATUSES FOR ASSEMBLING WASHER MEMBERS WITH FASTENER MEMBERS

Gerhard Lapohn, 4786 W. 220th St., Fairview Park, Ohio 44126

Filed Aug. 24, 1979, Ser. No. 69,558
Int. Cl.³ B23P *19/08*
U.S. Cl. 10—155 A **11 Claims**



1. An apparatus for assembling washer members on axially extending shank portions of fastener members including

a base,

an assembly wheel rotatably mounted on said base about an axis of rotation,

said assembly wheel having a plurality of pockets about the periphery thereof, each of said pockets adapted to receive a washer and a fastener therein in alignment with each other about an axis a distance R from the axis of rotation of said assembly wheel.

means for rotating said assembly wheel about its axis of rotation,

means for feeding the washers in an oriented position into said pockets of said wheel,

means for feeding the fasteners in an oriented position into said pockets of said wheel,

said pockets having at least one hook portion extending radially outwardly of the radius of rotation R on the upstream side of said pocket and downstream of the intersection of the radius of rotation R and the upstream side of said pocket,

a stationary arcuate cam secured to said base and extending about a portion of the periphery of said wheel after the washers and fasteners are received in said pockets of said wheel, said arcuate cam having an arcuate cam surface means for moving a plurality of one of the fasteners and the washers along a helical path and thereby effecting simultaneous relative movement between the fasteners and washers in the pockets by increasing the telescopic assembled relationship between the shank portions of the fasteners and washers and

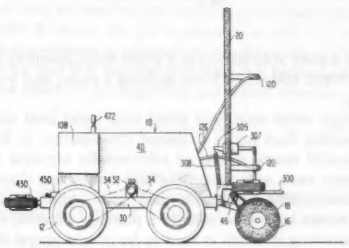
means for removing the fasteners and washers from said pockets of said wheel after the telescopic assembled relationship of the fasteners and washers is increased.

4,309,788

SELF-CONTAINED CLEANER FOR TRAILER INTERIORS

Douglas R. Brager, 2024 W. Greenough Dr., and Randall J. Kappes, 907 Alice, both of Missoula, Mont. 59801

Filed Nov. 27, 1979, Ser. No. 97,624
Int. Cl.³ B60S *3/00*
U.S. Cl. 15—53 A **17 Claims**



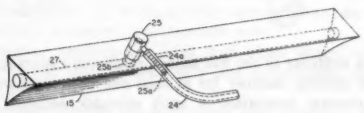
1. An apparatus for washing the interior of a vehicle of the type having a rear opening therein, comprising a self-propelled movable frame driven by means of an electric motor and operable to enter the rear of said vehicle for cleaning the same, electric storage batteries mounted on said movable frame and operable to power said electric motor, drive means powered by said electric motor and operable to propel said movable frame, water storage means mounted on said movable frame, water pump means for delivering water under pressure to a spraying means, and brush means for scrubbing the floor and at least a portion of the interior side walls of said vehicle.

4,309,789

SELF-DEICING WINDSHIELD WIPER

Erwin N. Ziner, 262 Pelham Island Rd., Wayland, Mass. 01778

Filed Sep. 11, 1980, Ser. No. 186,140
Int. Cl.³ B60S *1/04*
U.S. Cl. 15—250.36 **2 Claims**



1. A self-deicing windshield wiper system, comprising:

a wiper blade having flexible outer walls abutting a fluid-tight, expansible internal cavity extending along the length of said blade;

means for generating a pulsating fluid output, and

conduit means for connecting the fluid output to said fluid-tight cavity,

the volume per pulse of said pulsating fluid output being

sufficiently large to cause the pulsations of said internal cavity to flex rhythmically said outer walls.

4,309,790

WINDSHIELD WIPER YOKE

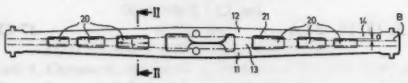
Kurt Bauer, Ingersheim; Georg Hesch, Sachsenheim; Hans Huber, Bietigheim-Bissingen; Helmut Markert, Pleidelsheim, and Christian Roth, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Sep. 26, 1979, Ser. No. 78,939

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1978, 2843249

Int. Cl.[3] B60S *1/32*

U.S. Cl. 15—250.42 8 Claims



1. In a main yoke for use in a wiper blade assembly having a wiper blade, said wiper blade defining a plane, said yoke comprising:

a single metal strip, said metal strip being bent along two bending lines into a U-shaped cross-section to form two parallel lateral shanks of substantially identical size and shape and a web connecting said shanks, said shanks being substantially parallel to said plane, the improvement wherein said web includes a plurality of slots, each slot extending in width at least as far as said lateral shanks.

4,309,791

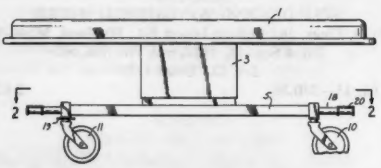
CASTER BRAKE AND SWIVEL LOCK FOR STRETCHER OR THE LIKE

Clarence J. Aulik, Manitowoc, Wis., assignor to American Hospital Supply Corporation, Evanston, Ill.

Division of Ser. No. 18,979, Mar. 9, 1979. This application Dec. 26, 1979, Ser. No. 106,998

Int. Cl.[3] B60B *33/00*

U.S. Cl. 16—35 R 10 Claims



1. A stretcher or the like having rotational casters having a swivel locking member for at least one caster, wherein the improvement comprises: a latch movably secured to the stretcher to engage the caster swivel locking member; a rotational member secured to the stretcher and having a longitudinal rotational axis extending in a direction parallel to the direction of movement of said stretcher; a connector member joining to the rotational member and extending transversely from the rotational member's longitudinal axis; said connector being joined to the latch, whereby rotation of the rotational member engages and disengages the latch with the lock structure on the caster.

4,309,792

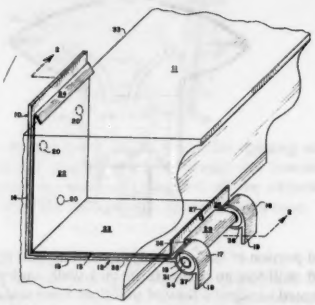
HINGED BRACKET ASSEMBLY FOR A DRAIN TROUGH

Lloyd H. Faye, 8821 Elm Rd., Richmond, Va. 23235

Filed May 12, 1980, Ser. No. 148,082

Int. Cl.[3] E05D *5/06;* E04D *13/06*

U.S. Cl. 16—389 4 Claims



1. A hinged bracket assembly for pivotably attaching a drain trough to the fascia of a building beneath the edge of a roof thereof comprising:

a. a harness member of integral monolithic construction derived from an extruded structure and having a generally L-shaped configuration comprised of a flat rear panel having straight parallel uppermost and lowermost edges, a flat bottom panel emanating from the lowermost edge of said rear panel, extending perpendicularly from said rear panel and terminating in a front edge, the lengths of said rear and bottom panels being equal, a retaining lip emanating from the uppermost edge of said rear panel and angled toward said bottom panel, an attachment strip emanating from the front edge of said bottom panel and extending upwardly therefrom, an extension plate emanating from the central portion of the front edge of said bottom panel and extending substantially forwardly therefrom, and an elongated rod of circular cross section emanating from said extension plate, the axis of said rod being parallel to the front edge of said bottom panel and the length of said rod being substantially equal to the lengths of said rear and bottom panels,

b. a bracket member of integral monolithic construction derived from an extruded structure and having a generally L-shaped configuration comprised of a flat vertical panel having straight parallel uppermost and lowermost extremities, a flat horizontal panel emanating from the lowermost extremity of said vertical panel, extending perpendicularly from said vertical panel and terminating in a forward edge, said vertical and horizontal panels being of equal lengths between parallel side edges, a pair of spaced apart coaxially disposed circular cylindrical bushings emanating from said forward edge, and having facing and outer extremities disposed in planes perpendicular to said forward edge, at least one of said bushings having a slot positioned at an elevation above said horizontal panel aligned coextensively with the axis of said bushings and having a width sufficient to permit edgewide passage of said extension plate, and abutment tabs emanating from said bushings at sites below said horizontal panel and extending downwardly therefrom, and

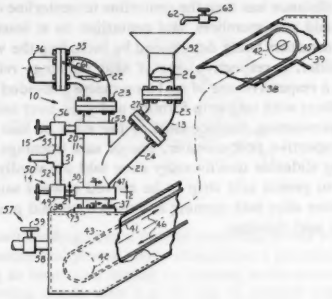
c. cylindrical sleeve bearings immoveably held within said bushings, said harness member being positioned with respect to said bracket member in a manner such that said rod is insertively and rotatably engaged by said sleeve bearings, and said extension plate is positioned between said bushings in sliding abutment therewith.

4,309,793

SHELLFISH MEAT AND SHELL SEPARATION PROCESS AND APPARATUS

Roger C. Martin, 1392 Lenora Dr., Merritt Island, Fla. 32952

Filed Feb. 25, 1980, Ser. No. 124,344
Int. Cl.[3] A22C 29/02
U.S. Cl. 17—46 17 Claims



1. An apparatus for separating shellfish meat particles from a mixture of shell halves therewith comprising an elongated, vertically arranged first conduit that has upper and lower ends, a lateral wall which extends between the ends and defines an elongated narrow zone for treating the mixture by elutriation to separate the meat particles and shell halves thereof, an opening at said lower end for passing the separated shell halves from the zone, an opening at said upper end for passing the separated meat particles from the zone, and an opening in the lateral wall which is offset from and located between the openings at said upper and lower ends, a second conduit communicating with the zone through the lateral wall opening for delivering the mixture of meat particles and shell halves to said zone, a controllable device communicating with the zone below said lateral wall opening for delivering water to said zone and therein establishing an upward water flow rate at the lateral wall opening which is sufficient to entrain and carry the delivered meat particles upwardly toward the upper end opening while permitting the delivered shell halves to gravitate downwardly toward the lower end opening, another controllable device for agitating the water in a first region of the zone which is between said lateral wall opening and said lower end opening to thereby upend the delivered shell halves in the first region and thereby accelerate the downward movement thereof toward said lower end opening, another controllable device for increasing the upward water flow rate in a second region of the zone which is between said lateral wall openings and said upper end opening to accelerate the upward movement of the meat particles in the second region toward said upper end opening, and means communicating with the zone through said upper end opening for receiving the separated meat particles passing therethrough.

12. A process for separating shellfish meat particles from a mixture of shell halves therewith comprising maintaining a confined elongated, narrow, vertically extending treatment zone having upper and lower end passages that communicate with the exterior of the zone, vertically spaced apart upper and lower regions that are located between said passages, and a separating region that is located in the space between said upper and lower regions, delivering the mixture of meat particles and shell halves to said separating region, continuously passing water upwardly through said zone and at a flow rate which is sufficient in the separating region to entrain and carry the delivered meat particles upwardly into said upper region while permitting the delivered shell halves to gravitate downwardly into said lower region, continuously agitating the water in said lower region to upend and thereby accelerate the downward gravitational movement toward the lower end passage therebelow of the shell halves in said lower region, receiving the shell halves from the treatment zone through said lower end passage, increasing the upward flow rate of water in said upper region to thereby accelerate the upward movement toward the upper end passage of the separated meat particles entrained thereby, and receiving the meat particles from the treatment zone through said upper end passage.

4,309,794

METHOD FOR THE SEPARATION OF FAT, PIGMENTS AND ENTRAIL REMAINS FROM FISH RAW MATERIAL

Jan Raa, Tromso; Terje Strom, Tromsdalen; Even Tidemann, Krokelvdalen, and Ola Eide, Tromsdalen, all of Norway, assignors to Fiskeriteknologisk Forskningsinstitutt, Tromso, Norway

Filed Apr. 23, 1980, Ser. No. 143,134
Claims priority, application Norway, May 3, 1979, 791481
Int. Cl.[3] A22C 25/16
U.S. Cl. 17—46 5 Claims

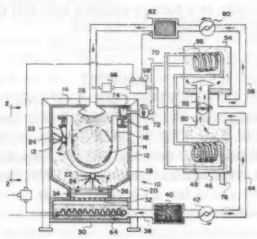
1. Method for the separation of fat, pigments and entrail remains from fish raw material including fish bones, characterized in that fatty or lean fish raw material is held in an aqueous environment in which the pH is adjusted to pH 3–5, and in which the temperature is adjusted within the range of 20°–50° C., removing said fish material including fish bones as a solid phase from dissolved fat, pigments and entrail remains.

4,309,795

METHOD AND APPARATUS FOR DE-HAIRING HOGS

Knud Simonsen, P.O. Box 4, Nobleton, Ontario, Canada (L0G 1N0)

Filed Apr. 2, 1980, Ser. No. 136,692
Claims priority, application Canada, Apr. 6, 1980, 325109
Int. Cl.[3] A22B 5/08
U.S. Cl. 17—47 16 Claims



1. The process of continuously scalding and dehairing hogs under improved sanitary conditions and comprising;

conveying hogs in an essentially horizontal manner through an elongated closed housing, being open at both ends, and defining a predetermined treatment path;

continuously spraying the hogs with clean water, while moving the same continuously and horizontally along such path;

continuously rotating the hogs along such treatment path and continuously scraping the hogs to remove hair therefrom while moving along such treatment path;

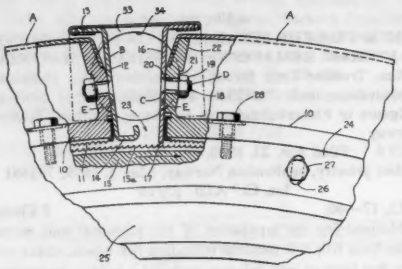
collecting water beneath the hogs, filtering the water, passing it into an evaporation chamber, evaporating the water to produce water vapour and passing said water vapour to a condenser chamber; and,

continuously condensing said vapour therein to provide clean uncontaminated water at an elevated temperature, for spraying onto the hogs aforesaid.

4,309,796
CARDING TRASH REMOVING APPARATUS AND METHOD

Joe K. Garrison, Piedmont, and Brian C. Claycomb, Taylors, both of S.C., assignors to John D. Hollingsworth On Wheels, Inc., Greenville, S.C.

Filed Jul. 2, 1979, Ser. No. 53,760
Int. Cl.[3] D01G *15/82*
U.S. Cl. 19—98 8 Claims



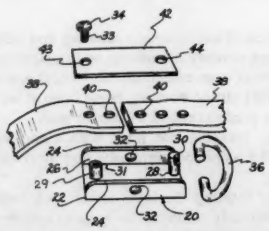
1. Trash removal apparatus for a carding machine having a clothed cylinder comprising:
- a stationary flat carrying card clothing on an inner surface thereof in a carding relation to said clothed cylinder;
- a first plate carried for vertical adjustment relative to said stationary flat varying the setting between the first plate and said clothed cylinder;
- a second plate independent of said first plate;
- means mounting said second plate in closely set relation to said clothed cylinder;
- means mounting said first and second plates in circumferentially spaced relation to each other adjacent a trailing edge of said stationary flat forming a slot; and

said first plate being carried adjacent said stationary flat; whereby said first and second plates are so set, independently of each other, in relation to said clothed cylinder that said second plate acts as a barrier causing said slot to be self-expelling of trash, short fibers and the like.

4,309,797
COUPLING DEVICE FOR ANIMAL COLLARS

Benton Schrougham, 243 S. 25th St., Beech Grove, Ind. 46107, and John W. Lee, 7791 W. 96th St., Zionsville, Ind. 46077

Continuation-in-part of Ser. No. 942,459, Sep. 15, 1979, Pat. No. 4,174,553. This application Sep. 19, 1979, Ser. No. 77,114
Int. Cl.[3] A44B *11/00*
U.S. Cl. 24—307 2 Claims

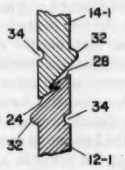


1. In a coupler device for fastening an animal collar provided with an opening near each end of said collar, the combination of a base member having upstanding, longitudinally extending side portions defining the width of a channel and including a post member disposed near each end of said channel and upraised from the lower surface of said base member, each of said post members including a shoulder forming a stop means and each being adapted to receive a respective one of said openings provided near the respective ends of said collar, one of said shoulders being outwardly facing and provided on one of said post members, the other of said shoulders being provided on a threaded member removably mounted on the other of said post members; a locking member comprising a strip of material including a pair of openings spaced from one another a predetermined distance less than the centerline to centerline distance between said post members, said centerline on at least one of said post members being determined by including the width of said shoulder, a respective one of said openings releasably engaging a respective one of said stop means provided on said post members with said strip forming a closure over said channel and preventing displacement of the ends of said collars from a respective post member, one of said openings in said strip being slideable downwardly over said outwardly facing shoulder to permit said strip to be moved toward said other post member after said opening is disposed on said post member below said shoulder.

4,309,798
FAIL-SAFE SLIDE FASTENER

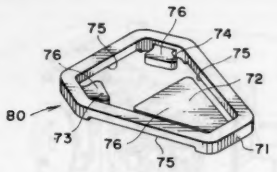
John B. Fraga, 1486 Kolln St., Pleasanton, Calif. 94566

Filed Jan. 7, 1980, Ser. No. 109,793
Int. Cl.[3] A44B *19/04*
U.S. Cl. 24—205 R 6 Claims



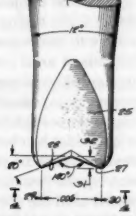
1. A positively locking slide fastener assembly comprising:
- first and second trains of locking elements, each said element being provided with an interlocking hook-like extension and locking surface;
- strips of fabric for holding said trains of elements, and for securing the assembly in place;
- means for mounting said trains of elements in opposed facing relationship to one another on said strips of fabric, with the adjacent elements in each train being reversed in orientation relative to one another, and with opposed elements in the two trains being oriented with their hook-like extensions pointing in the opposite directions to facilitate engagement of said locking surfaces of each pair of opposed elements;
- slider means for fastening and unfastening said opposed trains of locking elements, said slider means including camming surface means for engaging said locking elements to tilt them away from their normal plane so that opposite locking elements may easily engage and disengage from one another as said slider is moved to close or open the assembly;
- a movable handle secured to said slider means; and
- means for shifting at least certain of said camming surfaces into operative positions when said handle is moved into its operative position.

4,309,799
BELT HOLDING DEVICE
Taizo Noda, Nishinomiya, Japan, assignor to Kohshoh Limited, Kyoto, Japan
Filed Jul. 20, 1979, Ser. No. 59,438
Claims priority, application Japan, Aug. 26, 1978, 53-104288
Int. Cl.³ A44B 11/00
U.S. Cl. 24—315 4 Claims



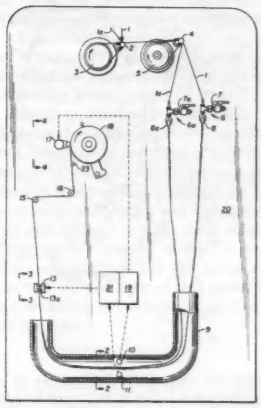
1. A belt holding device formed integrally in one piece from a continuous and planar blank, comprising a peripheral frame defining an inner area having an opening in the center thereof for allowing a belt with legs to pass in crossed relationship therethrough and three projections extending from said frame toward generally the center of said inner area, three elongated slits extending in the inner area along the frame in communication with said central opening, each of said slits extending between two adjacent projections and adapted to allow at least one leg of said belt to thread therethrough, said inner area being formed in the form of a pentagon, one of said projections extending from one corner of said pentagon and having an arcuate inner edge and a pair of converging straight edges extending toward said one corner, each of other projections extending from each of alternate sides of said pentagon defined between other corners thereof and having a substantially trapezoidal shape in plan view, portions of said belt holding device which are contacted by the legs of the belt being formed with a thickness substantially thinner than the thickness of remaining portions of said device, thereby allowing said device to hold belt with legs in crossed relationship.

4,309,800
FELTING NEEDLE
Edson P. Foster, Cato, Wis., assignor to Foster Needle Co., Manitowoc, Wis.
Filed Aug. 2, 1979, Ser. No. 63,294
Int. Cl.³ D04H 18/00
U.S. Cl. 28—115 3 Claims



2. A felting needle having a body portion with a wedge edge at its front end, a forwardly-directed fiber-engaging open double barb in the wedge edge, said double barb being a substantially symmetrical indented configuration having opposed outwardly and forwardly diverging fiber-engaging surfaces, and wherein the outwardly and forwardly diverging fiber-engaging surfaces provide between them an included angle of between 120° and 180°, and wherein the wedge edge is formed between two converging wedge surfaces, and wherein the wedge edge is formed in a conical tip of the felting needle, the conical tip having a taper of between 7°–15° and being substantially circular in cross section.

4,309,801
TEXTURIZING PROCESS
Philip C. Feffer, Silver Spring, Md., assignor to Chevron Research, San Francisco, Calif.
Filed Jun. 28, 1979, Ser. No. 52,880
Int. Cl.³ D02G 1/16, 1/12
U.S. Cl. 28—248 11 Claims

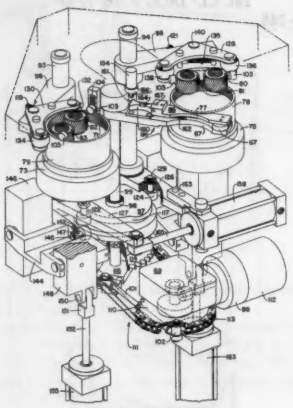


1. A process for texturizing thermoplastic yarns which comprises the steps of:
(a) simultaneously texturizing at least two drawn yarns in distinct texturizer means;
(b) collecting all of the texturized yarn by winding said yarns on the same winder spindle;
(c) sensing the relative tension on each texturized yarn at a position between said texturizer means and said winder spindle and reducing the rate of yarn wind-up when the sensed tension on any yarn exceeds a predetermined relative high tension value and increasing the rate of yarn wind-up speed when the sensed tension on all the yarns is not greater than said predetermined value; and
(d) when the sensed tension on at least one of said yarns decreases below a predetermined low tension value selectively applying sufficient tension on every yarn, whose sensed relative tension is at least equal to said predetermined low tension value, at a location between said sensing means and said winder spindle, sufficient to cause loop-to-loop yarn compaction to be pulled therefrom, without removing yarn crimp, thereby lengthening that yarn, whereby approximately equal lengths of said yarns are wound on said winder spindle.

4,309,802
RING GEAR BURNISHING MACHINE
Arne R. Jorgensen, Lombard, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Jul. 16, 1980, Ser. No. 169,252
Int. Cl.³ B24B 39/00
U.S. Cl. 29—90 B 30 Claims

1. A ring gear burnishing machine comprising first and second burnishing stations at which first and second ring gear workpieces are respectively burnished in an overlapping cycle wherein said burnishing stations each comprise a vertically displaceable support table, burnishing gear means, and burnishing gear engagement means and said machine further comprises a first rotatable cam surface, first cam follower means

engaging said first cam surface, support table control means coupled to said first cam follower means for raising and lowering said support tables so that ring gear workpieces on said tables are raised to a burnishing position or lowered to loading position at different times under control of said first cam surface, a second rotatable cam surface, second cam follower means engaging said second cam surface, burnishing gear engagement control means coupled to said second cam follower means, for controlling said burnishing gear engagement



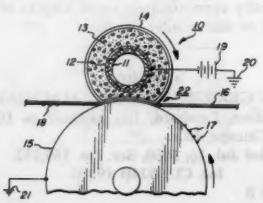
means so that the ring gear workpieces at each burnishing station are engaged by and disengaged from said burnishing gear means at different times in an alternating fashion, drive means for rotating said first and second cam surfaces, dwell means for interpreting said drive means for a predetermined period of time during which said burnishing gear means at each station are both in engagement with a ring gear workpiece and rotation means for causing rotation of both of said burnishing gear means relative to said ring gear workpieces on said support tables.

4,309,803

LOW COST FOAM ROLL FOR ELECTROSTATOGRAPHIC REPRODUCTION MACHINE

Joseph R. Blaszak, East Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 29, 1980, Ser. No. 191,579
Int. Cl.³ G03G *15/06*
U.S. Cl. 29—130 **11 Claims**



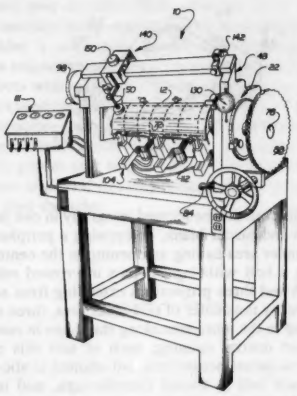
1. An inexpensive conformable roll for use in an electrostatographic copying machine which comprises a conductive core made of a paper base having a layer of a conductive material thereon, a compressible foam layer formed in situ on said core, and an outer smooth surface layer on said foam layer.

4,309,804

METHOD FOR ATTACHING DIE PLATES TO CYLINDER SEGMENTS

Albert J. Sarka, 18828 Canyon Rd., Fairview Park, Ohio 77126

Filed Apr. 5, 1979, Ser. No. 27,469
Int. Cl.³ B23P *15/24, 15/28*
U.S. Cl. 29—407 **8 Claims**



1. A method of attaching a pair of die plates to respective cylinder segments accurately relative to each other so that material-forming lands on the die plates properly cooperate with each other to cut material which is advanced through a nip defined by the die plates, each of said die plates having a timing land in a predetermined spacial relationship with said material-forming lands and two skew lands aligned with the timing land and located adjacent opposite edges of the die plates, said timing land and said two skew lands lying on a line which is transverse to the longitudinal extent of said die plate, said method comprising the steps of mounting one of said cylinder segments in a predetermined relationship with an arbor, placing a first die plate on the one of said cylinder segments, locating the first die plate at a particular circumferential position on the cylinder segment by (a) locating only a single view finder in a predetermined axial and circumferential position relative to the one of said cylinder segments, and (b) moving the first die plate until the timing land on the plate is accurately positioned relative to said view finder, locating the first die plate in a predetermined axial position on the one of said cylinder segments in a nonskewed position relative to the one of said cylinder segments by (a) locating the first die plate so that a first edge having a skew land is in a predetermined position relative to said view finder by changing the position of the arbor, cylinder segment, and first die plate as a unit relative to said view finder, (b) moving the first die plate relative to the one of said cylinder segments until the skew land adjacent said first edge of the first die plate is accurately positioned relative to said view finder, (c) locating the second, opposite edge of the first die plate which has a skew land in a predetermined position relative to said view finder, and (d) moving the first die plate relative to the one of said cylinder segments until the skew land adjacent said second edge of the first die plate is accurately positioned relative to said view finder, fixedly connecting said first die plate to said first cylinder segment, and repeating said steps to secure said second die plate to said second cylinder segment.

4,309,805

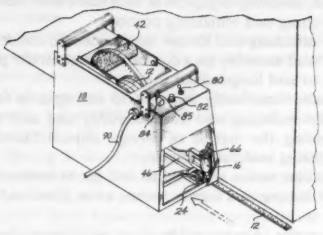
CARPET TACK-STRIP INSTALLING METHOD

Gerald D. Jacobson, Everett, Wash., assignor to J & L Machinery, Inc., Everett, Wash.

Division of Ser. No. 931,198, Aug. 4, 1978, Pat. No. 4,225,074. This application Jun. 6, 1980, Ser. No. 157,280

Int. Cl.[3] B23P *19/00*

U.S. Cl. 29—429 4 Claims



1. A method for installing carpet tack-strip on a floor adjacent a wall comprising the steps of:

(a) providing bulk tack-strip in the form of a roll;

(b) moving said roll of tack-strip along a floor adjacent a wall;

(c) unwinding said tack-strip from said roll of tack-strip;

(d) feeding said tack-strip into a position on said floor adjacent said wall with the tack points directed upwardly; and,

(e) nailing said tack-strip to said floor at intervals along the length of said tack-strip as said roll of tack-strip is being moved.

4,309,806

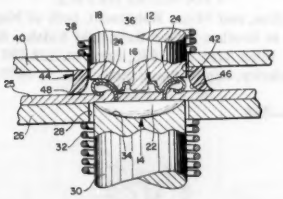
APPARATUS AND METHOD FOR APPLYING A SNAP FASTENER TO A SHEET MATERIAL

Augustine Cilione, North Providence, R.I., assignor to U.S. Industries, Inc., New York, N.Y.

Filed Jan. 21, 1980, Ser. No. 115,244

Int. Cl.[3] B23P *11/00*

U.S. Cl. 29—432.1 7 Claims



1. Apparatus for applying a snap fastener to an imperforate sheet of material, wherein said snap fastener includes a cap member having fastening means extending outwardly thereof and a fastener member that is shaped to receive said fastening means for interlocking said cap and fastener members on opposite sides of said sheet material, comprising a first tool member that is locatable on one side of said sheet material during the applying operation and that is engageable with said cap member for moving said cap member in an axial direction to cause said fastening means to penetrate said sheet material, a second tool member locatable on the other side of said sheet of material during the applying operation and being disposed in substantially coaxial alignment with respect to said first tool member, said second tool member being engageable with said fastener member for moving said fastener member in an axial direction toward said cap member during the applying operation, wherein said fastener member receives said fastening means in locking engagement therewith after penetration of said fastening means through said sheet material means extending outwardly from one of said tool members to support said sheet material and thereby promote the stretching thereof during said applying operation, and an annular flexible member fixed to the other of said tool members for contacting said sheet material upon the axial movement of said tool members during the applying operation, said annular flexible member contacting said sheet material circumferentially of said cap and fastener members and being deformable for radially urging the sheet material circumscribed thereby into a stretched position as said fastening means penetrate through said sheet material during engagement of said cap member with said fastener member, wherein wrinkling of said material after disengagement of said tool members following the applying operation is prevented.

4. A method of applying a snap fastener to an imperforate sheet of material, wherein said snap fastener includes a cap member having fastening means joined thereto and a fastener member that is shaped to receive said fastening means for interlocking said cap and fastener members on opposite sides of said sheet material, comprising the steps of moving said cap and fastener members in coaxial relation on opposite sides of said sheet material and into contact therewith for penetration of said fastening means therethrough and simultaneously providing support to one surface of said sheet material while contacting the other surface thereof in such a manner as to radially stretch the material contacted and penetrated by said fastening means so that upon release of said material after the applying operation wrinkling of the material around the assembled snap fastener is avoided.

4,309,807

METHOD OF MAKING COMPOSITE CONNECTOR AND USING SAME

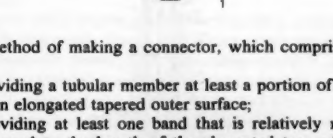
Frederick W. L. Hill, Lechlade, and Robin J. T. Clabburn, Highworth, both of England, assignors to Raychem Limited, London, England

Continuation of Ser. No. 742,562, Nov. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 741,523, Nov. 12, 1976, abandoned. This application Nov. 27, 1978, Ser. No. 964,850

Claims priority, application United Kingdom, Nov. 17, 1975, 47252/75

Int. Cl.[3] B23P *11/02*

U.S. Cl. 29—446 33 Claims



1. A method of making a connector, which comprises the steps of:

(a) providing a tubular member at least a portion of which has an elongated tapered outer surface;

(b) providing at least one band that is relatively narrow compared to the length of the elongated tapered outer surface, the band being made from a material which exhibits a relatively low modulus of elasticity at a first temperature and a relatively high modulus of elasticity at a second temperature;

(c) positioning such a band about the narrower end of the tapered surface of the tubular member; and

(d) forcing the positioned band at said first temperature along and against the elongated tapered surface so that the band is progressively expanded solely by the tapered surface, the relatively high modulus of elasticity of the material of the band being such that when the band is brought to said second temperature it contracts and deforms the tubular member.

22. A method of making a connection to at least one substrate which comprises the steps of:

(a) positioning said substrate within a connector comprising a tubular member, at least a portion of which has an elongated tapered outer surface, and a band positioned about said tubular member away from the narrower end of the taper, the band being relatively narrow compared to the length of the elongated tapered outer surface, the band being made from a material which exhibits a relatively low modulus of elasticity at a first temperature and a relatively high modulus of elasticity at a second temperature and being capable of contracting on being brought to said second temperature; and

(b) bringing said band to said second temperature so that it contracts and deforms the tubular member and forces it into firm connection with the substrate.

26. A method of making a connection to at least one substrate which comprises the steps of:

(a) providing a tubular member at least a portion of which has an elongated tapered outer surface;

(b) providing at least one band made from a material which exhibits a relatively low modulus of elasticity at a first temperature and a relatively high modulus of elasticity at a second temperature, the band being relatively narrow compared to the length of the elongated tapered outer surface;

(c) positioning said band about the narrower end of the elongated tapered surface of the tubular member;

(d) forcing said band at said first temperature along and against the elongated tapered surface so that the band is progressively expanded solely by the tapered surface, the relatively high modulus of elasticity of the material of said band being such that when the band is brought to said second temperature it contracts and deforms the tubular member;

(e) positioning said substrate within said tubular member; and then

(f) bringing said band to said second temperature so that it contracts and deforms the tubular member and forces it into firm connection with the substrate.

4,309,808

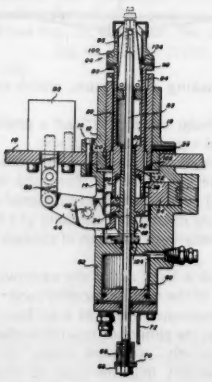
LEAD CUT AND OUTWARD CLINCH MECHANISM

Weibley J. Dean, Hillcrest; Robert H. Holmes, and Phillip A. Ragard, both of Binghamton, all of N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Jan. 7, 1980, Ser. No. 109,874

Int. Cl.³ B23Q *41/00*; H05K *13/04*; B21F *11/00*

U.S. Cl. 29—566.3 **7 Claims**



1. An apparatus for shearing the ends of the component leads projecting through a circuit board and clinching the remaining portions to the underside of said circuit board, and comprising:

a spindle reciprocatable along and pivotal about a longitudinal axis;

a head assembly mounted to said spindle and comprising pivotal former means and immobilized cutter means for cooperating with said pivotal former means and shearing said ends, said former means for guiding and receiving said leads into said head assembly and for moving said leads into shearing engagement with said cutter means and for clinching said remaining portions;

means for attaching said former means and said cutter means to said head assembly on a common axis generally perpendicular to said longitudinal axis;

cover means removeably attached to said spindle for substantially enclosing said head assembly and said spindle and limiting the ingress of foreign objects thereto and immobilizing said cutter means;

adjustable bias means attached to said cover means for adjustably biasing said former means away from said cutter means;

spreader means reciprocatable along said longitudinal axis relative to said spindle for engaging said former means and actuating said shearing and clinching against the biasing of said bias means;

detector means for engaging said leads during said shearing and for detecting the presence and absence of said leads;

a scrap removal means in said head assembly for receiving said sheared ends and evacuating them out of said head assembly;

a tubular housing telescopically receiving an adjustable bearing means for telescopically receiving said spindle and adjusting upper and lower limits of reciprocation of said spindle;

indexing means for rotating said spindle about said longitudinal axis and orienting said former means for reception of said leads; and

means for actuating said index means, reciprocating said spindle, and reciprocating said spreader means, upon command.

4,309,809

MACHINE TOOL WITH AN AUTOMATIC TOOL CHANGING DEVICE

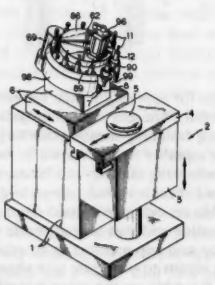
Masaaki Yokoe, and Mituo Kobayashi, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 10, 1980, Ser. No. 128,899

Claims priority, application Japan, Mar. 9, 1979, 54-27940

Int. Cl.³ B23Q *3/157*

U.S. Cl. 29—568 **10 Claims**



1. A machine tool provided with an automatic tool changing device comprising:

(a) a frame,

(b) a spindle head mounted on the frame adapted for rotatably carrying a spindle having a tool receiving hole,

(c) a tool magazine mounted on the spindle head being adapted to be rotated about an axis intersecting the axis of the spindle at a fixed angle,

(d) a plurality of tool carrying arms supported by the tool magazine in a circular array equally spaced from one another, each of the arms being adapted to be swingable in a plane which includes the axis of the tool magazine and extending in a radial direction from the axis, each of said arms rotatably carrying a tool about an axis positioned in said plane,

(e) each of the tool carrying arms being provided with an annular bearing portion for carrying said tool rotatably about the axis thereof,

(f) holding means for normally holding the tool carrying arms in a first position in which the tool is detached from the spindle,

(g) indexing means operatively connected to the tool magazine for rotating and holding it in a first position in which the axis of a selected tool carried by a selected tool carrying arm lies in a plane including the axis of the spindle and the axis of the tool magazine,

(h) moving means for moving the selected tool carrying arm from the first position to a second position in which the selected tool is directly set in the tool receiving hole of the spindle and alternately from the second position to the first position so as to detach the selected tool from the spindle, and

(i) transmitting means for transmitting the rotating motion of the spindle to the selected tool set in the tool receiving hole of the spindle, said assembly permitting rotation of the selected tool set in the tool receiving hole while being non-detachedly carried by the selected tool carrying arm.

4,309,810

POROUS METAL FILMS

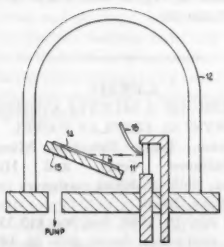
Miles P. Drake, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 22, 1980, Ser. No. 171,218

Claims priority, application United Kingdom, Aug. 9, 1979, 27785/79

Int. Cl.³ H01G *9/00*; B05D *5/12*; C23C *11/00*

U.S. Cl. 29—570 **9 Claims**



1. A method of making an electrolytic capacitor comprising the steps of:

providing a substrate having a surface,

feeding an anodizable metal from a reel of wire to a heat source,

evaporating said metal to form a metal vapor,

depositing said metal vapor on said substrate surface at an angle of incidence less than 60° and in the presence of oxygen at a partial pressure not exceeding 10^{-4} Torr so as to provide a porous metal coating,

anodizing the surface of the porous coating,

providing electrical contact to said anodized surface, and

winding said substrate having said anodized porous coating into a capacitor.

4,309,811

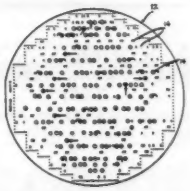
MEANS AND METHOD OF REDUCING THE NUMBER OF MASKS UTILIZED IN FABRICATING COMPLEX MULTILEVEL INTEGRATED CIRCUITS

Donald F. Calhoun, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 211,701, Dec. 23, 1971, abandoned, which is a division of Ser. No. 16,868, Mar. 5, 1970, abandoned. This application Jul. 26, 1973, Ser. No. 383,020

Int. Cl.³ H01L *21/16, 21/283*

U.S. Cl. 29—574 **13 Claims**



1. An integrated circuit interconnection method for interconnecting operable circuits into an electrical function on each of a plurality of integrated circuit wafers, each of the wafers capable of performing the same electrical function and having a plurality of operable and inoperable circuits occurring in random positions, each of the circuits having primary signal-connect means associated therewith in a first level of metalization, comprising the steps of:

predetermining desired identical positions of operable circuits at a level subsequent to the first level of metalization on all of the wafers irrespective of the actual random positions of the operable circuits on individual ones of the wafers;

testing the circuits of each of the wafers at the primary signal-connect means for determining the actual positions of the operable circuits;

comparing all of the tested wafers for determining the coincidence of a plurality of actual positions of operable circuits;

selecting at least one group of the compared wafers having the coinciding actual positions of operable circuits which are sufficient in quantity for performing the electrical function;

based upon said comparing and selecting steps, preparing a mask having means therein for defining where the primary signal-connect means of the coinciding operable circuits are to be extended to secondary signal-connect means;

electrically coupling and routing the primary signal-connect means of each of the coinciding operable circuits of each of the selected wafers in the group in an identical manner therefor to sites of the secondary signal-connect means thereon by using the mask for thereby terminating each of the coinciding operable circuits of the selected wafers at the secondary signal-contact means; and

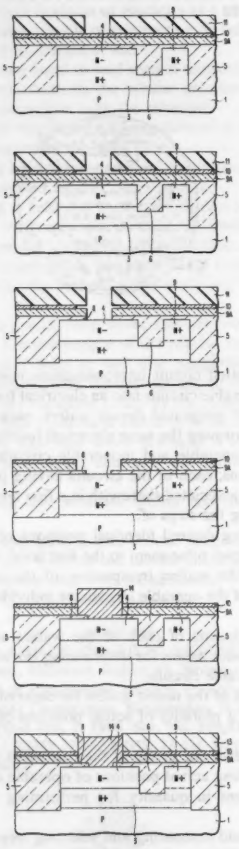
electrically coupling and routing the secondary signal-connect means to signal-connect means in the subsequent level of metalization and at locations defined by the predetermined identical desired positions by utilizing masking means identical to all of the wafers, including the group thereof, for interconnecting the coinciding operable circuits of the group and the operable circuits of others of the wafers in such a manner as for enabling each of the wafers to perform the electrical function.

4,309,812

PROCESS FOR FABRICATING IMPROVED BIPOLAR TRANSISTOR UTILIZING SELECTIVE ETCHING

Cheng T. Horng; Robert O. Schwenker, both of San Jose, Calif., and Paul J. Tsang, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 3, 1980, Ser. No. 126,610
Int. Cl.[3] H01L *21/265, 21/285, 21/31*
U.S. Cl. 29—578 **11 Claims**



1. In a process for forming an improved bipolar transistor in a silicon substrate of a first conductivity type, said silicon substrate having a planar surface, a subcollector region of a second conductivity type formed in said substrate, an epitaxial layer of said second conductivity type formed on said planar surface of said substrate, and at least first and second spaced apart recessed oxide isolation regions extending through said epitaxial layer into said substrate, said process including the following steps:

(a) forming a first oxide layer on said epitaxial layer;

(b) forming a silicon nitride layer on said first oxide layer;

(c) forming a second oxide layer on said silicon nitride layer;

(d) deposit a layer of photoresist on said second oxide layer;

(e) utilize E-beam photolithography to form a small emitter window in said photoresist layer, said emitter window being spaced between said first and second isolation regions;

(f) remove said second oxide layer exposed by said emitter window and also an adjacent surrounding portion of said second oxide layer beneath said photoresist;

(g) utilizing said emitter photoresist window reactive ion etch said silicon nitride layer and said first silicon oxide layer exposed through said window;

(h) ion implant an emitter region with dopant of a second conductivity type;

(i) remove said photoresist layer; and

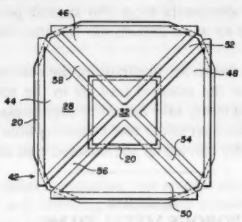
(j) remove the portion of said silicon nitride layer exposed in step (f) and corresponding in area to said removed adjacent surrounding portion of said second layer.

4,309,813

MASK ALIGNMENT SCHEME FOR LATERALLY AND TOTALLY DIELECTRICALLY ISOLATED INTEGRATED CIRCUITS

Richard Hull, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 107,118, Dec. 26, 1979, abandoned.
This application Dec. 4, 1980, Ser. No. 212,799
Int. Cl.[3] G03F *9/00*; H01L *21/308*
U.S. Cl. 29—580 **11 Claims**



1. A method of aligning mask to a substrate comprising:

forming a rectangular indicia on said substrate and an X indicia on said mask whose legs represent the angular relationship of the diagonals of said rectangle; and

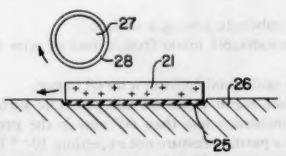
adjusting the position of said mask and substrate relative to each other until the legs of said X intersect the four corners of said rectangle.

4,309,814

MANUFACTURE OF A MULTI-LAYERED LIQUID CRYSTAL DISPLAY PANEL

Toshiaki Takamatsu, Tenri; Shigehiro Minezaki, Ikoma; Masataka Matsuura, Tenri, and Hisashi Uede, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 18, 1980, Ser. No. 113,337
Claims priority, application Japan, Jan. 20, 1979, 54-5718
Int. Cl.[3] G02F *1/13*
U.S. Cl. 29—592 R **6 Claims**



1. A method for making a multi-layered liquid crystal display which comprises a plurality of liquid crystal cells defined on a plurality of stacked supports and a liquid crystal composi-

tion injected into each of the respective liquid crystal cells, said method comprising the steps of:

rubbing one surface of one support of said plurality of supports for ensuring proper molecular alignment thereon, said one support requiring rubbing on both of its surfaces for molecular alignment to satisfy the requirements of the multi-layered crystal display;

overlaying said rubbed surface of said one support with a protective coating; and

subsequently rubbing another surface of said one support for ensuring proper molecular alignment thereon while said already rubbed surface of said one support is covered by said protective coating, thereby completing treatment for molecular alignment on both sides of said one support.

4,309,815

METHOD OF MANUFACTURING A HOUSING FOR A SMALL ELECTRICAL MACHINE

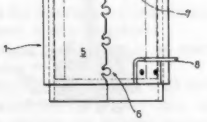
Jakob Schmitt, and Willy Voit, both of St. Ingbert, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 28, 1979, Ser. No. 16,061

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1978, 2810215

Int. Cl.³ H02K *15/14*

U.S. Cl. 29—596 **12 Claims**



1. A method for manufacturing a housing for a small electrical machine, particularly a small electric motor with permanent magnets, the housing forming a part of the magnetic circuit of the electrical machine, the method comprising the steps of providing a cylindrical wall constituted by a magneto-conductive material; and placing a sheet-metal strip constituted by a magneto-conductive material onto said cylindrical wall and securing the sheet-metal strip in position on said cylindrical wall, said placing and securing being performed by bending of said sheet-metal strip about said cylindrical wall so that the latter serves as a mandrel.

4,309,816

METHOD OF MANUFACTURING GAS-CHARGED ELECTRIC SWITCHES

Hidetoshi Takeyama; Yukihiro Uezasa, and Yasuo Yuasa, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

PCT No. PCT/JP79/00045, § 371 Date May 12, 1980, § 102(e) Date May 12, 1980, PCT Pub. No. WO80/00637, PCT Pub. Date Apr. 3, 1980

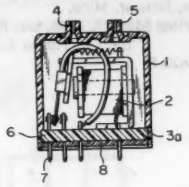
PCT Filed Feb. 26, 1979, Ser. No. 197,802

Claims priority, application Japan, Sep. 12, 1978, 53/112512

Int. Cl.³ H01H *11/00*

U.S. Cl. 29—622 **1 Claim**

1. A method of manufacturing gas-charged electric switches characterized in that an electric switch housing step in which an electric switch is housed in a container provided with two gas substituting ports and with an electric switch housing opening and said opening is tightly sealed, a gas pouring step in which a gas is poured through one of said gas substituting ports and a gas in the container is discharged through the other gas substituting port, and a gas sealing step in which the gas substituting ports are tightly sealed with punches are performed sequentially in the general atmosphere.



4,309,817

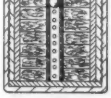
METHOD FOR ASSEMBLING AN ELECTROCHEMICAL CELL

Franz Goebel, Sudbury, and Ibsen R. Hansen, Newton, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 29, 1980, Ser. No. 145,108

Int. Cl.³ H01M *4/08, 6/00*

U.S. Cl. 29—623.1 **16 Claims**



1. A method for assembling a carbon cathode structure for an electrochemical cell, comprising the steps of:

arranging a selected number of individual porous carbon elements, each having an opening extending therethrough defining an interior wall portion, within and relative to a housing for an electrochemical cell and also relative to an elongated metal current collector so that the current collector is loosely disposed within and along the openings in the carbon elements and the carbon elements loosely surround the current collector in a stacked array within the housing of the cell, said current collector being a hollow elongated metal tube having a central opening along its length and further being permanently expandable and being initially in a non-expanded state in which it is spaced from the interior wall portions of the stacked array of carbon elements, said current collector further having a plurality of openings formed therein along its length; and

expanding the elongated current collector outwardly from its initial non-expanded state to a permanently expanded state by an amount to cause the current collector to make direct physical contact with the interior wall portions of the stacked array of carbon elements thereby to secure the array of carbon elements to the current collector,

said step of expanding the current collector comprising the steps of:

inserting and progressively advancing a tool into and along the central opening of the elongated current collector tube to permanently expand the tube outwardly to cause the expanded tube to make direct physical contact with the interior wall portions of the array of stacked carbon elements; and

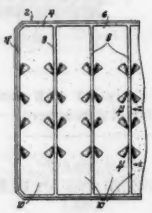
withdrawing the tool from the opening in the current collector.

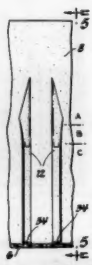
4,309,818

METHOD FOR MANUFACTURING A PREFORMED FLEX-RIB BATTERY CASE

Richard H. Kline, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 27, 1980, Ser. No. 153,334
Int. Cl.³ H01M 2/02
U.S. Cl. 29—623.1 4 Claims





1. A process for making a battery container comprising the steps of:

molding a container comprising (a) opposing walls defining at least one cell compartment including an opening for admitting the battery's electrochemical innards into the compartment and (b) ribs integrally molded with said walls, said ribs each having a root at said wall and a flexible part projecting from said root into said compartment at a first acute angle, said flexible part having a lead-in portion proximate said opening and a retaining portion remote from said opening for holding the battery's innards substantially centrally of said cell compartment; and

deflecting said lead-in portion toward its associated wall sufficiently to plastically deform its root such that upon removal of the deflecting means and prior to inserting said innards into said compartment said lead-in portion assumes a second acute angle with respect to said wall which is less than said first acute angle

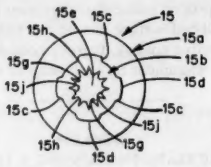
whereby a ramp-like transition section of rib is provided intermediate said portions and projects from said wall at an angle intermediate said second angle of said lead-in portion and said first angle of said retaining portion, which section facilitates deflection of said retaining portion by said innards during insertion into said compartment without deleteriously affecting said innards.

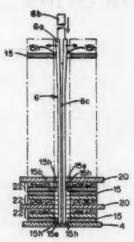
4,309,819

METHOD FOR ASSEMBLING AN ELECTROCHEMICAL CELL

Franz Goebel, Sudbury, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 13, 1980, Ser. No. 159,268
Int. Cl.³ H01M 4/08, 6/00
U.S. Cl. 29—623.1 23 Claims





1. A method for assembling cell components for an electrochemical cell, comprising the steps of:

arranging a plurality of cell components, each having an opening extending therethrough, relative to an elongated terminal member so that the terminal member is loosely disposed within and along the openings in the cell components and the cell components loosely surround the terminal member in a stacked array, said cell components including a plurality of metal electrodes each having a plurality of individual resilient, deflective portions lying in a flat, common plane and facing in the direction of the elongated terminal member and each deflective portion having a contact edge facing in the direction of the terminal member, said terminal member being expandable and being initially in a non-expanded state in which it is spaced from the resilient, deflective portions and contact edges of the metal electrodes; and

expanding the elongated terminal member radially outwardly from its initial non-expanded state to a permanently expanded state by an amount to cause the terminal member to make direct physical contact with the contact edges, deflect the resilient, deflective portions of the metal electrodes upwardly and downwardly in a random pattern relative to the initial planes of the deflective portions of the metal electrodes, and thereafter maintain direct physical contact with the contact edges of the deflective portions whereby said metal electrodes are secured to the terminal member.

4,309,820

APPARATUS FOR INSERTING A CLOSURE WITH A FEEDPIPE INTO A CONTAINER

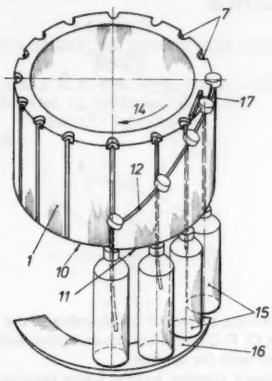
Hugo Schindel, Saulheim, Fed. Rep. of Germany, assignor to Rationator-Maschinenbau GmbH, Hillesheim, Fed. Rep. of Germany

Filed Dec. 12, 1979, Ser. No. 102,749

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1979, 2900432

Int. Cl.³ B23P *21/00*

U.S. Cl. 29—785 4 Claims



1. An apparatus for inserting a closure with a flexible feedpipe into a container, which comprises

(a) a drum arranged for rotation in an operating direction, the drum having

(1) a circumferentially extending wall defining circumferentially spaced and outwardly open vertically extending narrow grooves for holding respective ones of the pipes, and

(2) two end faces, each one of the narrow grooves having a recessed portion at an upper one of the end faces for holding the closure of the respective feedpipe, and

(b) a guide sheet fixedly mounted adjacent the circumferentially extending drum wall and covering a portion of the wall, the guide sheet having

(1) two end edges extending substantially in the planes defined by the two end faces and

(2) two oblique side edges downwardly inclined in said operating direction, the guide sheet causing successive ones of the feedpipes held in the grooves to be straightened in the grooves during rotation of the drum, an upper one of the guide sheet end edges supporting the closures in the recessed portion while the successive feedpipes are straightened and a leading one of the oblique guide sheet side edges supporting the closures while the straightened feedpipes are moved along a downward path in said grooves for insertion in successive ones of the containers.

4,309,821

RAZOR

John C. Terry, and John B. Taylor, both of Reading, England, assignors to The Gillette Company, Boston, Mass.

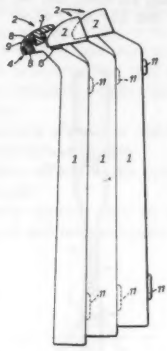
Filed May 22, 1980, Ser. No. 152,270

Claims priority, application United Kingdom, May 25, 1979, 18271/79

Int. Cl.³ B26B *21/06, 21/52*

U.S. Cl. 30—32 5 Claims

1. A disposable razor comprising an elongated handle, a transverse head at an end of said handle, said head carrying at least one razor blade having a cutting edge, said head having a cap portion, a guard portion, side walls, and a ledge portion, said cap portion, side walls, and ledge portion defining a pocket open from the rear of said head and dimensioned to receive a forward portion, including said cap portion, cutting edge and guard portion of an identical second razor positioned therebehind, said guard means of said second razor being in



engagement with said ledge portion of said head, and releasable coupling means adapted to permit firm but releasable engagement of said razors, one behind the other in relative positions in which said head of one said razor is positioned to shield said cutting razor blade edge of said second razor.

4,309,822

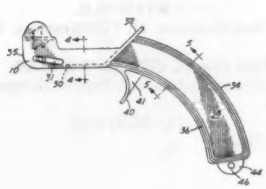
CABLE COVER SLITTING TOOL

Jerry Chirichigno, 1306 S. Jay St., Lakewood, Colo. 80215

Continuation-in-part of Ser. No. 9,763, Feb. 6, 1979. This application Oct. 29, 1979, Ser. No. 89,166

Int. Cl.³ B21F *13/00;* B26B *27/00*

U.S. Cl. 30—90.9 2 Claims



1. An electric cable cover slitter tool, comprising:

(a) a pair of spaced apart walls,

(b) a short top wall, less than the length of said pair of spaced apart walls, joining said spaced apart walls at the front portion thereof and having an open rear portion,

(c) a bottom wall joining said spaced apart walls from a point adjacent to and spaced rearwardly from said short top wall, leaving an opening for cables and terminating in a wall section angled from the plane of said bottom wall forming a cable release,

(d) handle means depending from said pair of spaced apart walls,

(e) knife means secured in said short top wall in position to slit a cable covering passing between said spaced apart walls, and

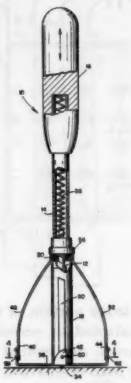
(f) roller means extending between said spaced apart walls, opposite said knife means, for holding said cable against said knife means during slitting.

4,309,823

ROTARY KITCHEN UTENSIL

Angelo Antolino, Pelham, N.Y.; Vincent Angelo, 56 Sherbrooke Dr., Smithtown, N.Y. 11787, and Joseph Angelo, 1061 Grant Ave., Pelham, N.Y. 10803, assignors to Vincent Angelo, Smithtown and Joseph Angelo, Pelham, both of, N.Y.

Filed Aug. 18, 1980, Ser. No. 179,031
Int. Cl.[3] A47J *43/04*
U.S. Cl. 30—276 10 Claims



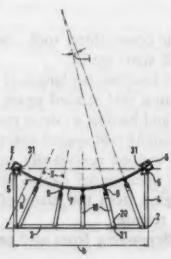
1. A hand-held kitchen utensil adapted for processing foods comprising manually operable drive means for converting linear to rotary motion, said drive means being coupled to a blade subassembly for rotation therewith in each of two directions, said drive means being housed within a protective tubular sleeve to prevent contact with the food substances being processed, the blade subassembly further having a barrel section interfitting with said tubular sleeve whereby the tubular sleeve is received within the barrel section during vertical displacement thereof.

4,309,824

METHOD AND AN ARRANGEMENT FOR PRODUCING A CURVED SAIL

Alfred Fuchs, Radolfzellerstr. 11, 7750 Konstanz, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,438
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2807954
Int. Cl.[3] B63H *9/06*
U.S. Cl. 33—174 G 9 Claims



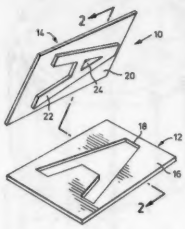
1. An apparatus for producing a curved sail from webs of material, comprising flexible plate means having a work surface, frame means for supporting and deforming said plate to the curved shape of a sail to be produced, bracket means adjacent opposed edges of said plate, said bracket means being pivotally mounted on said frame means for movement together with said plate when deformed to said curved shape, and means on said bracket means for marking and cutting to size the webs while on said work surface and for marking and cutting to size webs assembled as a sail.

4,309,825

STENCIL

David C. Geddes, 72 Jedburgh Rd., Toronto, Ontario, Canada

Filed Mar. 26, 1980, Ser. No. 134,206
Int. Cl.[3] B43L *13/20*
U.S. Cl. 33—174 B 1 Claim



1. For drawing a letter of the alphabet of the class comprising A, B, D, O, P, Q and R having an outline and a centre blank unconnected with the outline:

a main stencil member having a first opening therethrough defining said outline; and

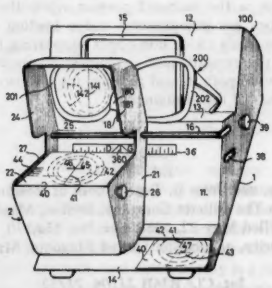
an auxiliary stencil member having an inwardly stepped subtending portion also defining said outline and registrable in mating relationship with the first opening in the main stencil member, the auxiliary stencil member and the subtending portion having a second opening therethrough defining said centre blank, the second opening lying wholly within the first opening and separated inwardly therefrom when the subtending portion mates with the first opening.

4,309,826

APPARATUS FOR DETERMINING THE DIAMETER OF CORRECTIVE LENSES

Jean-Louis Negroni, 16 boulevard des Allies, Choisy le Roi, France

Filed Jun. 16, 1980, Ser. No. 159,619
Claims priority, application France, Sep. 19, 1979, 79 15702
Int. Cl.[3] A61B *3/10;* G01B *9/08*
U.S. Cl. 33—200 14 Claims



14. Apparatus for determining the diameter of corrective lenses for a spectacle frame, comprising means for holding said spectacle frame in a predetermined orientation relative to a

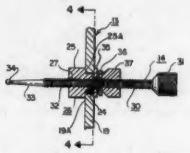
reference plane, a measuring scale parallel to said reference plane, guiding means parallel to said measuring scale, carriage means sliding on said guiding means in front of said measuring scale and said reference plane, said carriage means comprising a planar receiving surface forming an angle with said reference plane, said receiving surface adapted to receive removable plates provided with indicating marks representing at least the outline of one or more types of uncut corrective lenses, said carriage means further comprising a mirror placed at an angle between said receiving surface and said reference plane for displaying the indicating marks on said removable plates.

4,309,827

ADJUSTABLE SIGHTING DEVICE FOR ARCHERY BOWS

Marlow W. Larson, 2735 S. 4050 West, Ogden, Utah 84401

Filed Oct. 12, 1979, Ser. No. 84,502
Int. Cl.³ F41G *1/00*
U.S. Cl. 33—265 10 Claims



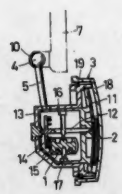
1. A sighting attachment for archery bows, including, in combination: a mount provided with means facilitating attachment to an archery bow, said mount including a plate portion provided with an interior slot; an elongate transversely disposed sighting element unit releasably secured to said plate portion and including a sighting element passing through said slot and having a sighting tip, said sighting element unit and said plate portion, proximate said slot, each having mutually cooperable, releasably-engaged toothed means for releasably fixing the position of said sighting element unit relative to said plate portion at said slot, said sighting element including position locking means, said toothed means of said sighting element unit comprising revolvable round gear means having an enlarged reaction surface abutting a side of said plate portion.

4,309,828

ATTACHMENT FOR A MAGNETIC NEEDLE ASSEMBLY FOR VEHICLES

Shoji Sakamoto, 38-16, Hikawadai, 4-chome, Nerima-ku, Tokyo, Japan

Filed Sep. 6, 1979, Ser. No. 72,637
Claims priority, application Japan, Nov. 2, 1978, 53/151340[U]
Int. Cl.³ G01C *17/04*
U.S. Cl. 33—355 R 5 Claims



1. A compass assembly for use in vehicles, comprising a housing having an opening and containing:

a first shaft means attached to said housing,

a spherical gear, coaxially and rotatably supported by said first shaft means,

a magnet secured within said spherical gear, said magnet and said spherical gear forming a one-piece unit,

an indicator plate having an aperture therein, said plate being secured to an external portion of said housing,

a second shaft means one end of which is rotatably mounted in said housing and the other end of which projects through the opening in said housing and through the aperture in said indicator plate, said second shaft means disposed at approximately a right angle to the axis of said first shaft means,

a second gear coaxially secured to said second shaft means and engaging said spherical gear,

an indicating pointer affixed to the projecting end of said second shaft means;

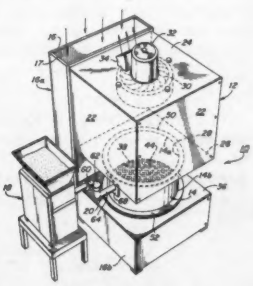
a transparent cover member secured to said housing to permit viewing of said indicator plate and said indicating pointer.

4,309,829

PARTICLE INJECTION SYSTEM FOR A FLUID BED DRYER

William Tesch, and Michael H. Lavallee, both of Milwaukee, Wis., assignors to Universal Foods Corporation, Milwaukee, Wis.

Filed Mar. 20, 1980, Ser. No. 132,270
Int. Cl.³ F26B *3/08*
U.S. Cl. 34—10 5 Claims



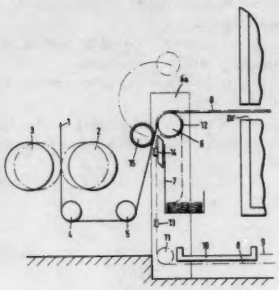
1. In a fluid bed dryer having a fluidizing chamber adapted to contain an easily agglomeratable material in particulate form and means for drawing a current of air through said fluidizing chamber to fluidize and dry said material and create a subatmospheric pressure within said fluidizing chamber, the improvement comprising: injector means for injecting said particulate material in a confined fluidized stream into said fluidizing chamber, said injector means comprising a short tubular element inserted into and communicating with said fluidizing chamber and terminating external to said fluidizing chamber in a funnel shaped collection means open to the ambient atmosphere surrounding said fluid bed dryer wherein said particulate material is introduced into said funnel shaped collection means and transferred into said fluidizing chamber by an air pressure differential between said fluidizing chamber and said collection means so that said particulate material is introduced into said fluidizing chamber in a fluidized state to remain in a particulate form and enhance the drying operation.

4,309,830

APPARATUS FOR THREADING A FLOAT WEB DRYER

Hilmar Vits, Leichlingen, Fed. Rep. of Germany, assignor to Vits Maschinenbau GmbH, Langenfeld, Fed. Rep. of Germany

Filed Mar. 18, 1980, Ser. No. 131,403
Claims priority, application Fed. Rep. of Germany, May 19, 1979, 2920329
Int. Cl.³ F26B 13/10, 13/20
U.S. Cl. 34—120 6 Claims



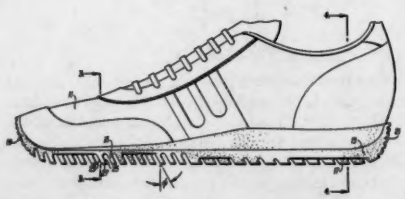
1. An apparatus for threading a web through a float web dryer having a web entrance and exit, the apparatus comprising a bar extending for the entire width of the web to be threaded and having ends projecting beyond the web's side edges, transport means for transporting the bar via both its ends transversely with respect to the web forwardly from a starting position outside of said entrance and through the dryer and to a position outside of said exit, said bar having web-engaging means for engaging the web substantially throughout its entire width when the web and bar are moved together tangentially relative to each other and releasing the web when the web and bar are moved apart from each other, and means for guiding said bar and web together tangentially at said starting position and apart at a position outside of said exit.

4,309,831

FLEXIBLE ATHLETIC SHOE

Donald S. Pritt, 4542 Emerson Ave., Rte. #2 North, Parkersburg, W. Va. 26101

Filed Jan. 24, 1980, Ser. No. 115,043
Int. Cl.³ A43B 7/06, 13/04
U.S. Cl. 36—3 B 4 Claims



1. In a shoe including an upper and a sole, said sole comprising

a base extending from the toe of said shoe to the heel of said shoe;

a plurality of cleats subtending from said sole;

the central axis of each of said cleats being at an angle between 10° and 45° subtending rearwardly from said base; and

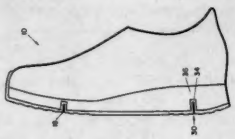
a second sole integrally attached to the terminal ends of said cleats.

4,309,832

ARTICULATED SHOE SOLE

Helen M. Hunt, Journey's End La., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 134,651, Mar. 27, 1980. This application May 16, 1980, Ser. No. 150,568
Int. Cl.³ A43B 13/04, 13/08, 13/14
U.S. Cl. 36—32 R 2 Claims



1. An athletic shoe comprising:

an upper;

a resilient sole attached to said upper, said sole comprising at least a first and a second portion capable of substantially independent vertical movement with respect to each other;

a first hinge means for connecting said first and second portions together, said first hinge means extending continuously across the width of said sole and passing substantially under the first metarso-phlangeal joint of the foot, said first portion of said sole extending forwardly of said first hinge means and said second portion extending rearwardly of said first hinge means;

a second hinge means extending continuously across the width of said sole in the location of the anterior heel region, thereby defining a third portion of said sole rearwardly of said second hinge means; and,

an outer sole included in said sole, said outer sole extending continuously through said first and second hinge means,

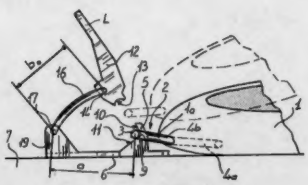
wherein the thickness of said sole above said first hinge means is thinner than the thickness of said sole above said second hinge means so that said first hinge means is more flexible than said second hinge means.

4,309,833

SKI BINDING AND BOOT

Georges P. J. Salomon, Le Bordet Quintal, Annecy, France (74000)

Filed Oct. 24, 1979, Ser. No. 87,780
Claims priority, application France, Oct. 24, 1978, 78 30199
Int. Cl.³ A43B 5/04; A63C 9/00
U.S. Cl. 36—117 41 Claims



1. A ski binding adapted to be used to maintain a boot on a ski, said binding comprising:

(a) a latching element adapted to be mounted on said boot; said latching element comprising at least one transverse bit;

(b) a support element adapted to be mounted on said ski, said

support element comprising a first support zone adapted to pivotably seat said transverse bit;

(c) a retention system for retaining said bit against the first support zone when said boot is inserted in said binding, said retention system comprising a mounting comprising a journalled portion mounted onto said ski, and a moveable pressure element journalled on said mounting, said moveable pressure element comprising a second support zone; said first and second support zones adapted to be positioned on said ski whereby said moveable pressure element is adapted to assume an unlocked position wherein said second support zone is spaced from said first support zone, and is further adapted to assume a locked position wherein said first and second zones hold said bit therebetween; and

(d) at least one elastic element positioned to force said second zone towards said first zone when said pressure element is in the locked position.

4,309,834

CROSS COUNTRY SKI BOOT

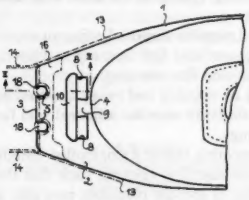
Alfred Bente, Herzogenaurach, Fed. Rep. of Germany, assignor to Adidas Sportschuhfabriken Adi Dassler KG, Herzogenaurach, Fed. Rep. of Germany

Filed Feb. 20, 1980, Ser. No. 123,083

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1979, 2906484

Int. Cl.³ A43B 5/04; A43C 9/00

U.S. Cl. 36—117 **10 Claims**



1. In a cross country ski boot having a front sole projection insertable in a binding portion of a ski binding supporting the sole projection at the sides and top thereof and which is securable against rearward withdrawal by a retaining member, the improvement comprising at least one slot in said sole projection having lateral flanks open at the front edge of said projection over the entire thickness thereof and extending longitudinally and rearwardly of said boot, whereby when in engagement with said binding portion a supporting element engages said slot and is in supporting contact with said flanks over substantially the entire weight thereof which corresponds to the thickness of the sole projection.

4,309,835

FOLDABLE FRAME STRUCTURE

Don A. Naeve, 651 Cambridge Dr., Richardson, Tex. 75080

Continuation-in-part of Ser. No. 63,974, Aug. 6, 1979, abandoned. This application Dec. 26, 1979, Ser. No. 106,942

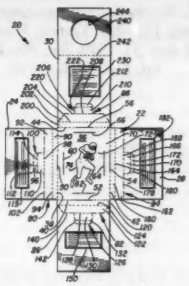
Int. Cl.³ G09F 3/00

U.S. Cl. 40—310 **7 Claims**

1. A product premium comprising:

a foldable frame having a multi-sided base with a wall portion extending from each side of the base, and

an extension detachably secured to the end of each wall portion along the edge of the wall portion remote from the attachment of the wall portion to the base, wherein said extension and wall portion are substantially equal in dimension to the base such that each said extension and wall portion may be folded to substantially overlie the base.



4,309,836

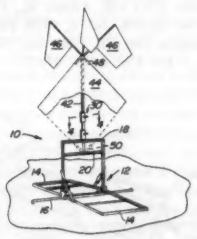
WIND DEFLECTABLE SIGN HOLDER

Michael Knapp, Elmira, N.Y., assignor to Eastern Metal of Elmira, Inc., Elmira, N.Y.

Filed May 27, 1980, Ser. No. 153,501

Int. Cl.³ G09F 7/00

U.S. Cl. 40—602 **8 Claims**



1. Apparatus for converting a sign panel rigidly connected to a support frame therebelow in a manner so that the sign panel is wind deflectable comprising:

(a) a resilient strip of material whose width is substantially greater than its thickness so as to have two major faces,

(b) an upper connector means secured to one major face of said strip adjacent one end portion and adapted to support a sign panel thereabove with the sign panel generally parallel to said one face, lower connecting means secured to a major face of said strip adjacent the other end portion thereof for connecting said strip to a support frame therebelow, one of said connector means being adjustable along the length of said strip for varying the effective length of the strip to adjust the effective resilience of said strip,

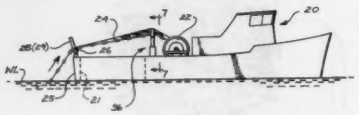
(c) whereby a sign panel coupled to a support frame by said strip will deflect in wind as permitted by the resilience of said strip.

4,309,837

APPARATUS FOR SHAKING FISH FREE FROM GILLNETS, LONGLINES AND SIMILAR FISH CAPTURING MEANS

Charles Raymond, Marshall, Calif., assignor to Anchor Machine & Manufacturing, Inc., Mt. Vernon, Wash.

Filed Apr. 11, 1980, Ser. No. 139,775
Int. Cl.[3] A01K 73/00
U.S. Cl. 43—8 20 Claims



1. Apparatus for shaking fish free from gillnets, longlines, and like fish-capturing means on a fishing vessel of the type having fish collecting means and means for hauling such fish-capturing means aboard, comprising, in combination:

(a) a deck mounted frame:

(b) a generally vertically oriented, elongate, rod-like member coupled to and supported by said frame with freedom for vertical reciprocation relative to said frame;

(c) means defining a support surface formed at the upper end of said rod-like member for receiving and guiding such fish-capturing means as such fish capturing means are hauled aboard the fishing vessel; and,

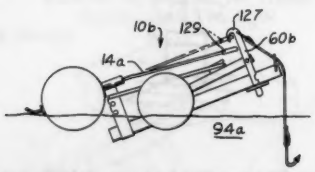
(d) drive means coupled to the lower end of said rod-like member for reciprocating said member in a vertical direction so as to impart rapid up-and-down vertical movement to said support surface at the upper end of said member to violently agitate the fish-capturing means being drawn over said support surface to thereby disengage fish from said fish-capturing means and permit such disengaged fish to fall into the fish collecting means on the fishing vessel.

4,309,838

FISHING APPARATUS HAVING MULTIPLE FLOATS

Vincent B. Hodshire, 2701 NE. Adams St., Peoria, Ill. 61603

Division of Ser. No. 55,494, Jul. 6, 1979, Pat. No. 4,270,298.
This application Oct. 20, 1980, Ser. No. 198,843
Int. Cl.[3] A01K 97/00
U.S. Cl. 43—15 3 Claims



1. A fishing apparatus comprising:

a main support member;

a first member connected to said main support and movable between first and second positions;

a trigger member connected to said first member;

means for retaining said trigger and said first member in said first position;

means for resiliently urging the trigger and said first member toward said second position;

means for supporting said apparatus substantially above a water surface, said means being a plurality of floats connected to said main support;

a catch attached to said trigger;

an insert mounted in and extending through one of said floats;

a fishing line extending through said insert; and

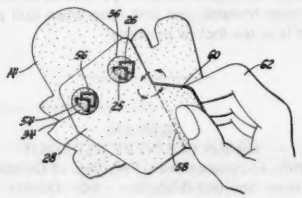
means connected to said fishing line for engagement with said catch and for automatic disengagement from said catch in response to gravity when said apparatus assumes a substantially horizontal position supported by said floats substantially above said water surface.

4,309,839

SHEET MATERIAL DEVICE WITH LOOSELY ROTATABLE MEMBER

David L. White, and Beverly A. White, both of 32560 Mason Ct., Westland, Mich. 48185

Filed Apr. 1, 1980, Ser. No. 136,364
Int. Cl.[3] A63H 3/38
U.S. Cl. 46—36 8 Claims



1. An amusement device, comprising:

a body member formed of sheet material, said body member having a front side and a rear side, and a first opening and a second opening extending between said front side and said rear side;

a first controlled member disposed adjacent the front side of said body adjacent said first opening and having a diameter larger than said first opening;

a handle having an opening and being disposed adjacent the rear side of said body member adjacent said first and said second openings;

first means connecting the first controlled member and the handle through said first opening such that the first controlled member is loosely rotatably movable in said first opening with respect to said body member as the handle is moved with respect to the body member;

a second controlled member disposed adjacent the second opening on the front side of the body, the second controlled member having a diameter larger than the second opening; a pair of tab means disposed in said second opening so as to be rotatably movable therein, each of said tab means having one end connected to the second controlled member in spaced relationship;

the opposite ends of said tab means passing through the handle opening in loosely rotatable relation thereto;

a washer member disposed adjacent and rearwardly of the handle opening and having a diameter larger than the handle opening; and

said washer having opening means for receiving and connecting the tab means such that as the handle is moved in a closed curved path of motion, the second controlled member is rotated with respect to said body member.

4,309,840

INFLATABLE TOP

Ralph J. Kulesza, Chicago, and Harry Disko, South Barrington, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

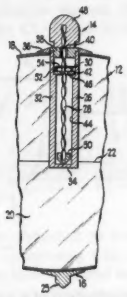
Filed Aug. 13, 1980, Ser. No. 175,691
Int. Cl.[3] A63H 1/06, 1/02, 3/06
U.S. Cl. 46—68 3 Claims

1. An inflatable top comprising:

a generally symmetrical, flexible, inflatable enclosure having

an axis and including a supporting means along said axis for supporting said top for rotation on a surface; and

a generally rigid rotation mechanism secured to said enclosure for converting linear motion along the axis of said enclosure to rotary motion around said axis, said mechanism including a helical member drivingly connected to said enclosure through a one-way clutch and mounted for reciprocal motion into and out of said enclosure along the axis of said enclosure, a housing extending inwardly of



said enclosure for receiving said helical member, said housing having means engageable by said clutch for imparting rotary motion to said enclosure, and a stop member on said helical member to prevent removal of said helical member from said housing, said housing extending from the surface of said enclosure into the interior of said enclosure, and having a free end spaced from said surface of said enclosure such that said enclosure provides a spring mounting for said mechanism when said enclosure is inflated.

4,309,841

TWO-WHEEL TOY VEHICLE WITH INERTIA FLYWHEEL

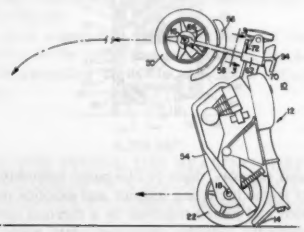
Kiyoji Asano, Tokyo, Japan, assignor to Shinsei Kogyo Company, Ltd., Tokyo, Japan

Filed Dec. 24, 1980, Ser. No. 220,103

Claims priority, application Japan, Dec. 28, 1979, 54-184338[U]; Feb. 19, 1980, 55-20120[U]

Int. Cl.³ A63H *17/16, 29/20*

U.S. Cl. 46—209 **21 Claims**



1. A two-wheel toy comprising:

(a) a body having a rear portion engageable with a running surface for guiding the vehicle in a forward movement along the running surface in a one-wheel upwardly-extended position;

(b) front and rear wheel axles mounted on said body;

(c) a first wheel freely rotatably mounted on said front axle and a second wheel rotatably mounted on said rear axle for driving the toy vehicle in both a one-wheel upwardly-extended position and a two-wheel position along the running surface; and,

(d) inertia energy storage and drive means mounted within said body and operatively connected to said rear wheel for activation by the rotation of said rear wheel and for driving the toy vehicle through said rear wheel, wherein the vehicle is driven forwardly in a one-wheel upwardly-extended position when said driven rear wheel and said rear portion of said vehicle body are engaged on the running surface and wherein the front wheel of the vehicle returns to the running surface when the stored inertia energy diminishes, the vehicle thereby moving forwardly in a normal two-wheel position, and wherein said storage and drive means comprises an inertia flywheel rotatably mounted within said body and operatively connected to said rear wheel for rotation in the same direction and transmission gear means for transmitting rotational movement between said flywheel and said rear wheel, the gear means including a first gear fixedly connected to said rear wheel for rotation with said rear wheel about said rear axle; a second gear fixedly connected to said flywheel for rotation with said flywheel; first, second, and third gear axles mounted within said body; and third, fourth fifth, sixth and seventh gears mounted on said gear axles, said third gear being mounted on said first gear axle and meshed with said first gear, said fourth and fifth gears being commonly mounted on said second gear axle with said fourth gear meshed with said third gear, and said sixth and seventh gears commonly mounted on said third gear axle with said sixth gear meshed with said fifth gear and said seventh gear meshed with said second gear.

16. A toy vehicle comprising:

(a) a body;

(b) front and rear wheels rotatably mounted to body;

(c) an inertia flywheel rotatably mounted within said body and operatively connected to said rear wheel for activation by the rotation of said rear wheel and for driving the toy vehicle along a running surface through said rear wheel;

(d) transmission gear means mounted in said body for transmitting the activation and driving forces between said inertia flywheel and said rear wheels; and

(e) means for absorbing transmission shock forces positioned between said inertia flywheel and said rear wheel and formed as a part of said transmission gear means, and wherein said shock absorbing means and said transmission gear means comprises a center transmission shaft rotatably mounted in said body and having a conical convex portion at one end, a first gear operatively connected to said rear wheel and fixedly mounted to said center shaft at the opposite end to said convex portion, a second gear operatively connected to said inertia flywheel, rotatably mounted on said center shaft and having a conical concave portion frictionally engageable with said conical convex portion of said center shaft, and a spring positioned between said first and second gears for urging said concave and convex portions into frictional engagement.

4,309,842

PORTABLE HERBICIDE AND INSECTICIDE APPLICATOR

James R. Jones, P.O. Box 313, Cross Plains, Tex. 76443

Filed Oct. 1, 1979, Ser. No. 81,038

Int. Cl.³ A01M *21/00*

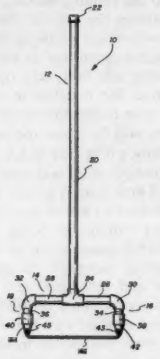
U.S. Cl. 47—1.5 **3 Claims**

1. A portable herbicide and insecticide applicator for selectively directed application of a herbicide or insecticide by a user comprising:

a frame comprising a hollow tubular handle section adapted for being grasped by the user to control application of herbicide and insecticide;

a hollow tubular bight section extending from said handle section;

a pair of hollow prong sections interconnected to said bight section and diverging therefrom in spaced apart relation;
said handle, bight and prong sections forming a liquid reservoir conduit means;
each of said prong sections having a discharge port disposed at the end thereof and communicating with said conduit means;
a rope-like element extending between said discharge ports in wicking relation with and saturated by said conduit



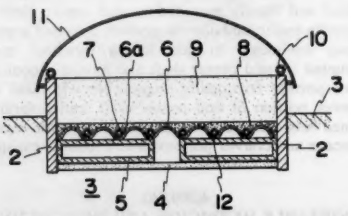
means, said rope-like element extending rectilinearly along its longitudinal dimension and being spaced apart from said applicator for permitting herbicide and insecticide to be applied to an object between said frame and said rope-like element; and
a helical shield surrounding said rope-like element adapted for protecting said element in rough environments without interfering with the application of herbicide or insectide.

4,309,843

CULTIVATING DEVICE FOR PLANTS

Tadaaki Kato, No. 6473, Minami Minowamura Tabata, Kamiinagun, Naganoken, Japan

Filed Sep. 11, 1980, Ser. No. 186,394
Int. Cl.³ A01G 9/00
U.S. Cl. 47—18 **3 Claims**



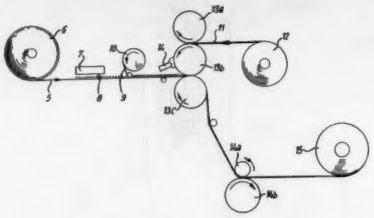
1. A plant cultivating device, comprising:
a plurality of partition wall plates, each being vertically positioned and having an upper portion and a lower portion;
a plurality of steam discharge pipes connected to said partition wall plates at said upper portion;
a corrugated plate interconnecting adjacent wall plates, said corrugated plates being positioned horizontally and being connected to said wall plates at said lower portion, said corrugated plate having a plurality of parallel grooves and ridges, with a plurality of holes positioned in said grooves;
a plurality of hot water pipes positioned in said grooves;
a shielding connected to said wall plates at said upper portion and enclosing an area between said wall plates.

4,309,844

PRODUCTION OF ARTIFICIAL GROWING MEDIUMS

David A. King, and Sidney J. Vallans, both of Accrington, England, assignors to Caligen Foam Limited, Accrington, England

Filed Jan. 14, 1980, Ser. No. 111,740
Int. Cl.³ A01G 9/10;
U.S. Cl. 47—56 **33 Claims**



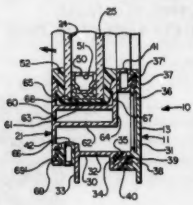
1. A process for the production of a seeded artificial growth medium comprising continuously feeding a flexible carrier sheet, applying seeds to the upper surface of the continuously moving sheet, moving a sheet of flexible foamed plastics material in synchronism with said carrier sheet, bringing aid sheet of foamed plastics material into juxtaposition with the upper surface of said carrier sheet after application of said seeds thereto, and continuously adhering the sheets together by fusion.

4,309,845

THERMALLY INSULATED HINGED WINDOWS AND DOORS

Dietrich F. Schmidt, Carlisle, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.

Continuation of Ser. No. 751,046, Dec. 14, 1976. This application May 8, 1978, Ser. No. 903,505
Int. Cl.³ E06B 3/00
U.S. Cl. 49—501 **5 Claims**



1. A hinged window, door or like panel assembly, comprising an outer frame including interior and exterior metal members separated and joined together by a thermal barrier member, an outwardly movable insulated glass panel having a continuous metal frame around the periphery thereof mounted in said outer frame, said continuous metal frame including a top rail, a bottom rail and a pair of side rails, each of said rails being one-piece metal members, a first perimeter seal means for thermally insulating the interior metal outer frame member from the metal panel frame and a second perimeter seal means for thermally insulating the exterior metal outer frame member from the metal panel frame, said first perimeter seal means being mounted or positioned on the exterior side of one end of the interior metal member of the outer frame, each of said rails of said metal frame around the periphery of the insulated glass

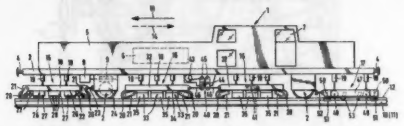
panel having a leg extending outwardly therefrom and said second perimeter seal means being mounted or positioned on the interior side of one end of said outwardly extending leg.

4,309,846

MOBILE MACHINE FOR REMOVING SURFACE IRREGULARITIES FROM RAIL HEADS

Josef Theurer, and Klaus Riessberger, both of Vienna, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jan. 29, 1979, Ser. No. 7,424
Claims priority, application Austria, Feb. 10, 1978, 978/78
Int. Cl.³ B24B *23/00*
U.S. Cl. 51—5 B **8 Claims**



1. A mobile machine mounted on a track for advancement therealong, the track comprising two rails each including a head having a running face, a lateral inside face and a lateral outside face, for removing surface irregularities from the faces of the rail heads, which comprises

(a) a machine frame,

(b) three sets of pairs of tool carriers, the tool carriers of each pair being substantially transversely aligned with respect to the track and a respective one of the tool carriers being associated with a respective one of the rails,

(1) each of the tool carriers being independently vertically adjustably mounted on the machine frame and arranged for independent movement and guidance along the respective rail in a vertical and lateral direction,

(2) a first one of the sets including one of said pairs of tool carriers and at least one metal cutting tool engageable with the running faces of the rail heads carried by the tool carriers of the first set,

(3) a second one of the sets including at least one other pair of tool carriers and at least one metal grinding tool arranged to be pressed against the running faces of the rail heads carried by the tool carriers of the second set, and

(4) a third one of the sets including a third pair of tool carriers and at least one metal shearing tool engaging with the lateral outside faces of the rail heads, and

(c) at least one longitudinally adjustable spacing member extending transversely to the track between the tool carriers of each pair,

(1) a pivot connecting respective ends of the spacing member to the respective tool carriers, the axes of the pivots extending vertically to a plane defined by the track.

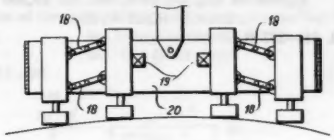
4,309,847

MACHINE FOR TRUING THE BEARING SURFACE OF THE RAILS OF A RAILROAD TRACK

Romolo Panetti, 22-24, Parc Chateau Banquet, Geneve, Switzerland

Division of Ser. No. 856,767, Nov. 29, 1977, Pat. No. 4,189,873, which is a division of Ser. No. 645,472, Dec. 30, 1975, abandoned. This application Mar. 29, 1979, Ser. No. 25,062
Claims priority, application Switzerland, Feb. 25, 1975, 002372/75
Int. Cl.³ B24B *24/00*
U.S. Cl. 51—178 **2 Claims**

1. A machine for truing the bearing surface of a rail of a railroad track, said machine comprising a frame movable over the rail; a train of two groups each of two contact elements mounted on said frame, said elements to be driven one behind the other over and along said rail tangentially of said bearing surface; pairs of beams to one of said groups of contact elements to define a deformable parallelogram; means to move at least one of said contact elements in the direction of each bearing surface to reach a predetermined position relative



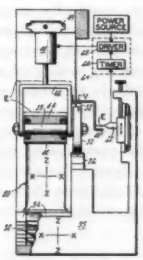
thereto, said means comprising a beam-carrying frame and means mounting said beams, centrally thereof, on said beam-carrying frame for pivotal movement thereof about axes located between the contact elements of said groups; and means for locking said at least one of said contact elements in said predetermined position.

4,309,848

TURBINE BLADE TIP FINISHING APPARATUS

John P. Arrigoni, Wallingford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 25, 1980, Ser. No. 124,500
Int. Cl.³ B24B *21/00*
U.S. Cl. 51—135 R **4 Claims**



1. In apparatus for finishing the tip of a gas turbine airfoil to a desired contour surface wherein said apparatus has a base with x, y, and z axes, abrasive means for removing material from the tip, and means for holding an airfoil on the base so its longitudinal axis is substantially aligned with the said z axis in a manner which presents the tip for contact by the abrasive, the improvements comprising:

means for translating the abrasive along the z axis, toward the airfoil tip location, with a generally reciprocating action on a first path in the y-z plane of the base, to remove material from multiple points on the tip;

means for guiding the abrasive in the y-z plane along a second path corresponding to the desired finished contour surface, said guiding means becoming independently operable along said z axis path of translation at a point proximate the intended finished contour surface location of the tip;

means for producing an output signal as a function of a location of the abrasive with respect to the finished contour line, said location being along said y-z plane path and spaced apart along the z axis from the intended finished contour surface location;

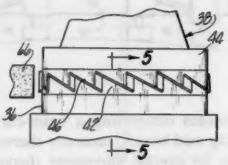
means, responsive to said signal, for terminating abrasive removal of material after a predetermined delay time.

4,309,849

WORKPIECE HOLDER

Melvin Kowalski, Lambertville, Mich., and E. N. Stefanelli, Perrysburg, Ohio, assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 875,196, Feb. 6, 1978, abandoned. This application Aug. 24, 1979, Ser. No. 69,306
Int. Cl.[3] B24B *41/06*
U.S. Cl. 51—237 R 18 Claims



1. An apparatus for holding a workpiece having curved, spaced apart, radial projections during a machining operation upon the radial tips of said projections comprising:

a first workpiece holding jaw, said first jaw having a first member made of a first resilient material and formed by casting the first resilient material onto one side of a workpiece so that the first member defines a plurality of gripping surfaces which continuously engage substantially the entire said one side of the radial projections despite the curved configuration of said one side of the radial projections;

a second workpiece holding jaw, said second jaw having a second member made of a second resilient material and formed by casting the second resilient material onto the opposite side of the radial projections so that the second member defines a plurality of gripping surfaces which engage substantially the entire said opposite side of the radial projections despite the curved configuration of said opposite side of the radial projections; and

means for axially compressing the jaws together with a workpiece positioned therebetween, whereby the gripping surfaces of said jaws flatly abut against their respective sides of the radial projections.

4,309,850

SANDBLASTING MACHINE

Ronald C. Benson, 2116 Second Ave. South, Minneapolis, Minn. 55404

Filed Aug. 9, 1979, Ser. No. 65,985
Int. Cl.[3] B24C *3/06*
U.S. Cl. 51—429 6 Claims

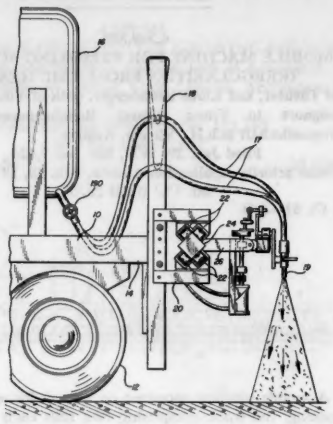
2. A mobile apparatus for sandblasting a roadway surface over which it is moving, having a frame supporting a source of pressurized sand and air mixture, a plurality of transversely spaced nozzles connected with said source and directed downwardly to sandblast a path on the roadway surface as the apparatus moves thereon, and means for adjustably mounting the nozzles on the frame which comprises:

(a) a base,

(b) a plurality of parallel levers each of which is connected pivotally to the base,

(c) means for mounting the nozzles to the levers so the nozzles may move with the levers in an oscillating fashion with respect to the base, and

(d) means for oscillating the levers with respect to the base, which further comprises means for slidably adjusting the



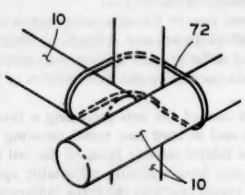
position of each of the levers to any point along the base so the spacing of the nozzles may be varied.

4,309,851

STRUCTURE OF INFLATABLE TUBES WITH CLOSED LOOP CONNECTORS

Rodger H. Flagg, 1415 Lynn Ave., Ft. Wayne, Ind. 46805

Filed Aug. 6, 1979, Ser. No. 63,941
Int. Cl.[3] E04B *1/34*
U.S. Cl. 52—2 8 Claims



1. A modular building construction for child's play comprising:

a plurality of separate, inflatable, elongated tubes;

one of said tubes being substantially upright and comprising a post;

a first plurality of second tubes being positioned substantially horizontally, and vertically stacked one over the other to form a substantially continuous planar upstanding first wall section, respective ends of said second tubes defining a wall section side and said second tubes being tangent to said post;

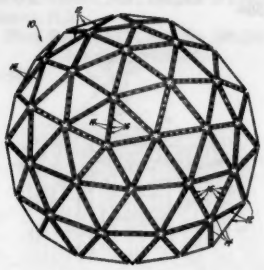
a plurality of flexible closed loop bands removable from said tubes, each of said bands being adapted for releasably attaching at least one of said second tubes to said post in snugly engaged relation to resist substantial relative movement between said tubes and said post to provide ease of assembly and to maintain said second tubes in the configuration of said wall section, and for providing relative movement between, and ease of disassembly of, said second tubes and said post when said band is removed.

4,309,852

KIT FOR ASSEMBLING GEODESIC STRUCTURE

Roger M. Stolpin, 1629 Ohio Ave., Flint, Mich. 48055

Filed Dec. 7, 1979, Ser. No. 101,398
Int. Cl.[3] E04B *1/32*
U.S. Cl. 52—81 5 Claims



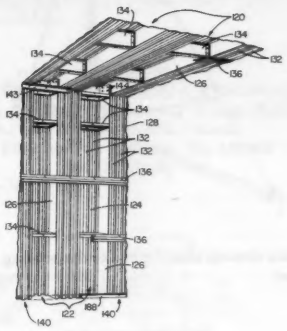
1. A unitary plastic injection molding for a geodesic sphere kit, said molding comprising: six triangular panels connected to each other; each triangular panel having straight sides and including a first set of male lugs and a second set of female lugs projecting from the sides thereof; said female lugs being arranged in pairs with the lugs of each pair spaced along the length of the associated panel side so as to receive a male lug on one side of another panel in order to provide a connection therebetween; and the male and female lugs including outer ends having connection surfaces that snap into engagement with each other as the male lug of each connection is inserted between the associated female lugs in order to secure the panel sides to each other and thereby prevent relative movement therebetween along the lengths thereof or transversely with respect to the length of each panel side, a first pair of the triangular panels being identical to each other, each triangular panel of said first pair having an isosceles shape and including a base side of a shorter length than the length of the equal sides thereof, the lugs on one of the equal sides of each panel of the first pair being positioned and of the proper gender so as to interfit with the lugs on the other equal side of the other panel of the first pair; a second pair of the triangular panels also being identical to each other, each triangular panel of the second pair having an isosceles shape whose base side is shorter than the equal sides thereof and whose size and shape is the same as the panels of the first pair, the lugs on the equal sides of the second pair of the triangular panels being positioned the same and of the same gender as the lugs on the equal sides of the first pair of triangular panels, the base side on each triangular panel of the second pair having the lugs thereon positioned and of the proper gender so as to interfit with the lugs on the base sides of the panels of the first pair, a fifth triangular panel of the molding having an isosceles shape whose base side is longer than the equal sides thereof, the lugs on one of the equal sides of the fifth panel being positioned and of the proper gender to interfit with the lugs on the corresponding other equal side of another like panel and the lugs on the base side thereof being positioned and of a proper gender to interfit with the lugs on the base sides of the first pair of triangular panels, a sixth triangular panel of the molding having an isosceles shape whose base side is longer than the equal sides thereof and whose size and shape is equal to the fifth panel, the lugs on the equal sides of the sixth panel being positioned the same and of the same gender as the lugs on the equal sides of the fifth panel and the lugs on the base side of the sixth panel being positioned and of the proper gender to interfit with the lugs on the base sides of the second pair of triangular panels and with the lugs on the base side of the fifth panel, whereby thirty of such moldings can be used to assemble a geodesic sphere.

4,309,853

FRAMELESS METAL BUILDING

Colin F. Lowe, 5518 Aspen, Houston, Tex. 77081

Continuation-in-part of Ser. No. 931,854, Aug. 7, 1978, Pat. No. 4,221,087, which is a continuation-in-part of Ser. No. 831,781, Sep. 9, 1977, Pat. No. 4,106,245. This application Dec. 14, 1978, Ser. No. 969,342
The portion of the term of this patent subsequent to Sep. 9, 1997, has been disclaimed.
Int. Cl.[3] E04B *7/02*
U.S. Cl. 52—90 12 Claims



1. A metal building comprising a roof assembly supported by spaced wall assemblies, at least one of said assemblies forming a frameless metal wall or roof for the building and including a series of elongated load bearing structural panels, each of said panels being formed of thin sheet metal bent along parallel spaced longitudinal lines to form a generally flat inner skin portion integrally connected to a generally flat outer skin portion by a generally flat web portion, each said panel having a uniform generally Z-shape cross-sectional configuration to provide for close nesting of individual said panels arranged in a stack, means connecting said outer skin portions of adjacent said panels and connecting said inner skin portions of adjacent said panels with said outer skin portions and said web portions of the connected said panels forming longitudinally extending parallel spaced primary corrugations, said inner and outer skin portions of the assembled said panels having longitudinally extending secondary corrugations forming ribs substantially smaller than said primary corrugations, a plurality of longitudinally spaced spacer members disposed within said primary corrugations between the opposing said web portions and connected to said web portions, each said spacer member extending across the connection of said outer skin portions forming the corresponding said primary corrugation, a plurality of elongated tie members disposed at longitudinally spaced intervals along said assembled panels and extending laterally across said primary corrugations and the connections of said inner skin portions, and means securing each said tie member to said inner skin portions of said assembled panels.

4,309,854

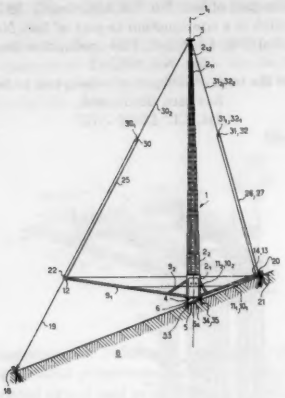
TELESCOPIC MAST

Dante Vendramini, 21, rue Felix Faure, 92700 Colombes, France

Filed Oct. 15, 1979, Ser. No. 75,710
Claims priority, application France, Sep. 18, 1978, 78 26728; Sep. 12, 1979, 79 22836
Int. Cl.[3] B66C *23/06*
U.S. Cl. 52—121 19 Claims

1. A telescopic mast comprising several elements of the mast body slidably arranged in relation to each other and cable means for the erection of the mast, wherein the cable is, before the erection, connected to all the elements and the erection is

carried out by a successive sliding of each element on the element below, said mast comprising means for separating the



cable of each element after the end of the hoisting operation of said element.

4,309,855

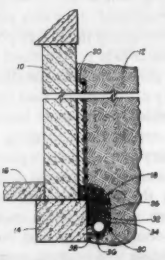
WALL DRAINAGE SYSTEM

Harold T. Pate, Solon, and Helmut P. Fochler, Chagrin Falls, both of Ohio, assignors to Indian Head Inc., New York, N.Y.

Filed May 2, 1980, Ser. No. 146,131

Int. Cl.[3] **E02B** *11/00;* **E02D** *31/02*

U.S. Cl. 52—169.5 **12 Claims**



1. A wall drainage system for protecting foundations, basement walls and the like comprising:

a water-impermeable synthetic resin backing plate having a first side adapted for securement to a surface of the structure to be protected and defining drainage channels along a second side thereof opposite said first side;

a water-permeable synthetic resin strainer film secured to the backing plate across said drainage channels to prevent dirt from clogging said channels; and

a bead pack assembly connected to the lower portion of said drainage plate for receiving water from said drainage channels, said bead pack assembly including:

a plurality of discrete synthetic resin beads peripherally bonded to each other to form a porous bead pack; and

a perforated drainage pipe below, and at least partially surrounded by, said porous bead pack for receiving water therefrom.

4,309,856

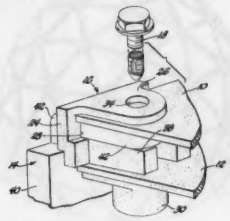
PANEL MOUNTING DEVICE AND ASSEMBLY

Michael J. Varnau, Bunker Hill, and William Gouge, Kokomo, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 22, 1980, Ser. No. 152,384

Int. Cl.[3] **H05K** *7/12;* **F16B** *19/00;* **H02B** *1/02*

U.S. Cl. 52—506 **2 Claims**



1. A panel mounting device for securing at least two panels in parallel spaced relation to a support bracket, comprising

an integral device of resilient insulating material having a rear wall portion, forwardly projecting lugs attached to the wall portion at the ends thereof, and a forwardly projecting spacer attached to the wall portion intermediate the lugs, the spacer having parallel surfaces facing the lugs, one of the surfaces being spaced from its facing lug by a distance approximately equal to the thickness of the panel to be mounted therein and the other of the surfaces being spaced from its facing lug by a distance approximately equal to the combined thickness of the support bracket and the panel to be mounted therein,

an aperture in the wall for receiving said support bracket between one of the lugs and the spacer, and

apertures in the lugs for receiving a fastener for urging the lugs toward the spacer.

4,309,857

SOFFIT SUPPORTING STRUCTURE

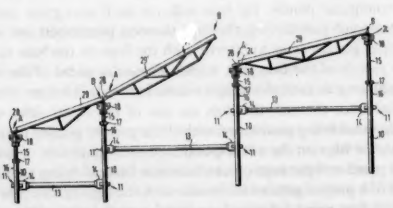
Dennis W. Lovering, Wolverhampton, England, assignor to Kwikform Limited, Birmingham, England

Filed Aug. 20, 1979, Ser. No. 67,800

Claims priority, application United Kingdom, Sep. 8, 1978, 36197/78

Int. Cl.[3] **E04G** *25/00*

U.S. Cl. 52—632 **13 Claims**



1. A soffit supporting structure comprising first and second parallel and vertically disposed props connected together by at least one horizontal member, the first prop being provided with a first supporting head at its upper end and the second prop with a second supporting head at its upper end, and a primary shoring beam supporting the soffit, the beam comprising first and second ends, the beam extending between the props, wherein first means are provided to fixedly support the first end of the beam by the first supporting head against movement in a direction parallel to the longitudinal axis of the beam

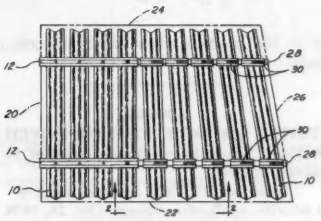
and second means are provided to support the second end of the beam by the second supporting head for movement in a direction parallel to the longitudinal axis of the beam.

4,309,858

SUPPORT FOR CEILING PANELS

Joseph A. Anderle, Clifton, N.J., assignor to Levolor Lorentzen, Inc., Lyndhurst, N.J.

Filed Dec. 7, 1979, Ser. No. 101,241
Int. Cl.³ E04B 5/57
U.S. Cl. 52—632 **9 Claims**



1. A support for supporting ceiling panels in a space having two non-parallel walls, comprising:

at least two channel means arranged essentially parallel to and spaced from each other and having means for supporting at least one ceiling panel therefrom essentially perpendicular to said channel means;

at least two telescopic channel means respectively received within said two channel means in a plurality of positions to vary the length thereof between said two non-parallel walls;

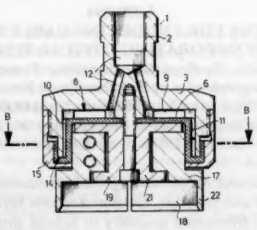
and at least two panel holders respectively supported on said two telescopic channel means, each panel holder having means for supporting a ceiling panel therefrom and being movable on the respective telescopic channel means, whereby the position of the respective panel holder may be varied along said telescopic channel means so that at least another ceiling panel may be arranged between said at least one ceiling panel and one of said two non-parallel walls so as to essentially evenly divide the space therebetween to reduce the appearance of the non-parallelity of the walls and ceiling panels.

4,309,859

COLLET HEAD AT A SEALING MACHINE

Hugo Schindel, Obersaulheimer Str. 64, 6501 Saulheim 1, Fed. Rep. of Germany

Filed Oct. 22, 1979, Ser. No. 86,660
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1978, 2846846
Int. Cl.³ B67B 3/20; B65B 7/28
U.S. Cl. 53—331.5 **4 Claims**



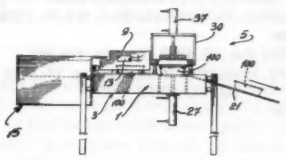
1. A collet head for a sealing machine for the accommodation of seals, particularly threaded seals for containers, said collet head comprising a bushing having an open end toward the exterior, accommodating the seal, characterized by a flexible diaphragm (6) arranged in the bushing (3) and contractible radially inward with the aid of a pressure medium, a contractible gripping member inserted into the open end of the bushing, said gripping member having a circumference engageable with the diaphragm so as to be radially contractible upon radial contraction of the diaphragm, said gripping member comprising jaws or segments (17) circumferentially displaceable to vary the grip opening thereof, and said jaws each being provided with an edge or foot (22) extending beyond the open end of the bushing, and means positioned in the open end of the bushing presenting guiding surfaces which capture and guide the gripping member.

4,309,860

MACHINE FOR CLOSING A RECEPTACLE

George Soga, Laval, Canada, assignor to Soga Packaging Machinery Co., Ltd., Montreal North, Canada

Filed Apr. 10, 1980, Ser. No. 138,848
Int. Cl.³ B65B 7/28
U.S. Cl. 53—76 **7 Claims**



1. Apparatus for securing covers to, and sealing, metal foil containers, each of which containers includes an open top, horizontal flange surrounding the open top, and an upwardly extending peripheral flange surrounding the horizontal flange, each cover being disposed on the horizontal flange of its respective container;

said apparatus comprising;

a first station comprising a pre-securing and sealing station;

a second station comprising a securing and sealing station disposed on one side of said first station;

means for moving containers, one at a time, from said first station to said second station, disposed on the other side of said first station;

conveyor means at one end of said first station for conveying unsealed containers to said first station;

means for detecting the presence of a container in said first station and for activating said means for moving when a container is detected in said first station;

whereby, when a container is detected in said first station, said means for moving will be activated to move said container from said first station to said second station;

said second station comprising;

a stationary platform at substantially the same level as the top surface of said first station;

a ring means surrounding said platform, the outer edge of said ring means, as seen in top view, having substantially the same shape and dimensions as the outer edge of said container, as seen in top view;

means for imparting vertical motion to said ring means;

a die disposed vertically above said ring means and having an inner camming surface, the bottom edge of said camming surface having substantially the same shape and dimensions as the outer edge of said ring means;

an opening extending vertically through said die, said opening being of the same shape as, but of smaller dimensions than, the bottom edge of said camming surface, and being concentric therewith;

press means disposed for passage through said opening of said die, said press means having the same shape as said

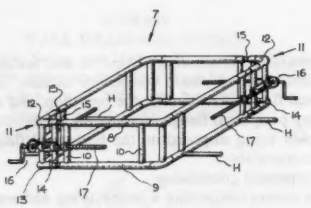
opening of said die and being dimensioned for easy clearance therethrough;
means for imparting vertical motion to said press means;
means for activating the means for imparting vertical motion to the ring means when the container is moved from the first station to the second station; and
means for activating the means for imparting vertical motion to the press means when the container is at the top edge of the camming surface;
whereby, when the container is moved from the first station to the second station, the top surface of the ring will engage the horizontal flange of the container and move the container upwardly so that the vertical flange thereof will engage the camming surface of the die and be crimped inwardly and downwardly; and
whereby, when the container is at the top edge of the camming surface, the press means will move downwardly on the top of the crimped peripheral flange to press it level with the top surface of the container cover to thereby secure the cover to the container and to seal the container.

4,309,861

METHOD AND APPARATUS TO STRETCH WRAP AN OBJECT IN PLASTIC FILM

Ladislav S. Karpisek, 86 Woodfield Blvd, N.S.W. 2229, Caringbah, Australia

Filed Jan. 23, 1980, Ser. No. 114,397
Claims priority, application Australia, Aug. 18, 1978, PD5555
Int. Cl.³ B65B *43/34*
U.S. Cl. 53—556 **3 Claims**



1. Stretch wrapping apparatus for stretch wrapping an object or an assembly of objects with a length of flexible elastically stretchable plastic film tube, said apparatus comprising a generally rectangular frame, said frame including two similar right-angled sub-frames oppositely disposed and two corner assemblies between adjacent ends of said sub-frames, said frame having a portion to hold said film tube so that said tube encircles said frame and extensible means coupling the corner assemblies to the sub-frames to move the sub-frames towards or away from the corner assemblies to contract or expand the frame and enlarge the cross-sectional dimension of the tube thereon so that when said frame **13** placed on said object, the enlarged tube encloses said object.

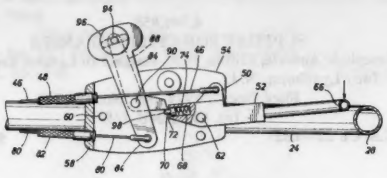
4,309,862

LAWN MOWER AND CONTROLS THEREFOR

John A. Carlson, Conroe, Tex., assignor to Capro, Inc., Conroe, Tex.

Filed Jun. 9, 1980, Ser. No. 157,374
Int. Cl.³ A01D *75/28*
U.S. Cl. 56—10.5 **10 Claims**

1. A lawn mower control system comprising
a control plate,
a throttle control lever pivotally mounted on said control plate,
a brake control lever pivotally mounted on said control plate,
said levers being independently movable, and
means on said brake control lever to releasably engage said throttle control lever subsequent to its setting and hold it in operating position and releasing said throttle control



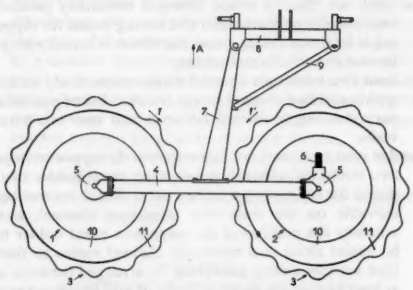
lever to idle position when said brake control lever is released.

4,309,863

HARVESTING MACHINE WITH IMPROVED SKIRTS

Albert Wattron, Schwenheim, France, assignor to Belrecolt, Marmoutier, France

Filed Oct. 17, 1980, Ser. No. 198,278
Claims priority, application France, Oct. 26, 1979, 79 27105
Int. Cl.³ A01D *75/20*
U.S. Cl. 56—320.1 **17 Claims**



1. A harvesting machine
comprising in combination:
at least one drum rotatable about an upright axis and open at the bottom,
skirt means secured to a lower part of said drum including
a first skirt substantially in the shape of a hollow truncated cone, and
a second skirt secured to said first skirt and extending therebelow, whereby only said second skirt makes operative contact with the ground, at least near the front of the harvesting machine as defined by the forward direction of its movement.

4,309,864

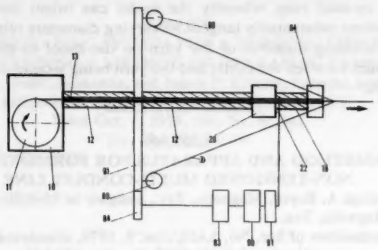
APPARATUS FOR PRODUCING CABLE ELEMENTS INCORPORATING OTPICAL FIBERS

Jean P. Hulin, Conflans Ste Honorine, France, assignor to Lignes Telegraphiques et Telephoniques, France

Filed May 12, 1980, Ser. No. 148,689
Claims priority, application France, May 30, 1979, 79 13754
Int. Cl.³ D07B *5/00*; D01H *13/04*
U.S. Cl. 57—6 **2 Claims**

1. An apparatus for producing cable elements incorporating optical fibers and ensuring the simultaneous laying of a plurality of optical fibers in a plurality of helical grooves having a simple or alternating pitch, of a cylindrical support, said apparatus comprising a laying head wherein is machined an opening for said support travelling continuously through said laying head, said laying head further comprising a system of fiber

guides constituted by hollow elastic metal tubes terminated at one of their ends by a bevel and resting inclined under pressure on the bottom of said grooves, said apparatus further comprising a plate carrying fiber stocks, means for rotating said plate



at a speed corresponding to the theoretical value of the pitch of said grooves, and a coupling device for fixing said head on said plate while permitting a relative rotation of the head and the plate.

4,309,865

METHOD AND APPARATUS FOR PRODUCING WINDINGS OF FIBER COMPOUND MATERIAL ON A CORE

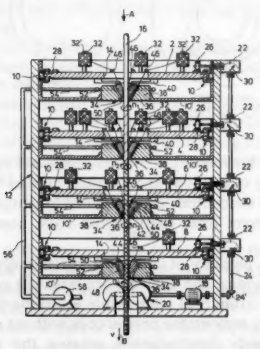
Klaus Brunsch, Weidach bei Wolfratshausen; Rudolf Schindler, Ottobrunn; Bernd Bongers, Heimstetten, and Ralf-Thilo Schulz, Ruhpolding, all of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Dec. 17, 1979, Ser. No. 104,567

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855638

Int. Cl.[3] D07B *7/14, 3/06;* D02G *3/36*

U.S. Cl. 57—15 **16 Claims**



1. A method for producing winding bodies of fiber compound material on a core in a winding operation, comprising the following steps: rotatably supporting a plurality of fiber coil carrier means in a column or row, advancing a core for said winding bodies substantially coaxially through all of said fiber coil carrier means, producing respective winding courses on said core by rotating each of said fiber coil carrier means independently of any other fiber coil carrier means, controlling the rotational speed of each fiber coil carrier means independently of the rotational speed of any other fiber coil carrier means, in such a manner that the speed of any fiber coil carrier means is inversely proportional to the pitch of the fiber turns in the respective winding course whereby the arrangement of the fibers varies from winding course to winding course in each winding body, and arranging on each fiber coil carrier means a predetermined number of fiber coils which number is inversely proportional to the rotational speed of the respective coil carrier means, whereby a plurality of windings each having a single layer winding course, are formed on said core.

4,309,866

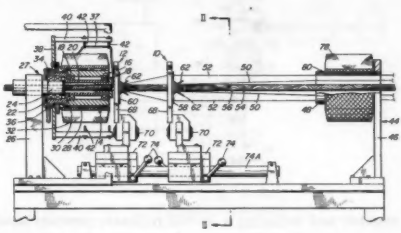
LAYING AND BINDING OPTICAL WAVEGUIDES ONTO A SUPPORT FILAMENT

Miguel Fombellida, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 20, 1980, Ser. No. 208,565

Int. Cl.[3] B65H *77/00, 81/06, 81/08*

U.S. Cl. 57—15 **5 Claims**



1. An optical waveguide laying and binding apparatus for laying at least one waveguide onto a support filament having a lay station to feed and assemble a waveguide onto filament, a binding station downstream from the lay station along a feed path of assembled waveguide and filament to wrap binding tape around the assembly of waveguide and filament, and a replacement spool station upstream from the lay station along feed paths of waveguide and filament, the apparatus comprising:

a binding unit in the binding station to be supplied with a spool of binding tape from upstream and support the spool with the asembly feed path passing through the spool;

replacement spool support means in the replacement spool station to support at least one replacement spool with the separate feed paths passing through the replacement spool; and

a waveguide laying structure comprising an annular laying unit and a holding means detachably connectable to the laying unit in the lay station to retain the laying unit in an operational position surrounding the filament feed path and for guiding the waveguide onto the filament, the holding means movable away from the laying unit and the feed paths while the laying unit is supported by the core, to create a path for movement of a replacement spool along the feed paths from the replacement spool station, through the lay station in which the laying unit passes through the replacement spool, and into the binding station.

4,309,867

YARN COVERING APPARATUS

Michihiro Ichikawa, Kiryu, Japan, assignor to Katsuzo Ichikawa and Yumiko Hori, both of Kiryu, Japan

Filed Jan. 15, 1980, Ser. No. 112,316

Claims priority, application Japan, Nov. 30, 1979, 54-155074

Int. Cl.[3] D02G *3/36, 3/38*

U.S. Cl. 57—58.3 **63 Claims**

1. A yarn covering apparatus comprising:

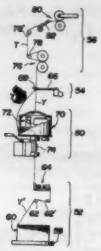
a rotor unit having a center axis therethrough and including a first rotatable member rotatable about said center axis and formed with a passageway which is adapted to have a covering yarn passed therethrough and which is open at the outer end of the rotatable member;

first and second members spaced apart from each other with rotatable member positioned therebetween the first mem-

ber being held stationary with respect to the center axis of said rotor unit and the second member being rotatable about said center axis with respect to the rotor unit;

positioning means arranged carried in part on said first member and in part on said second member and operative to urge the second member to stay in a predetermined angular position about said center axis with respect to said first member;

a core yarn delivery mechanism supported on said second



member and including a second rotatable member having a center axis therethrough and rotatable about the center axis thereof with respect to the second member;

first drive means operative to drive said rotor unit for rotation about the center axis thereof; and

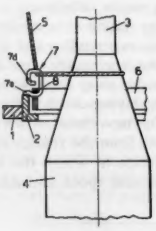
second drive means arranged carried in part on said first member and in part on said second member of the rotor unit and operative to drive the second rotatable member of said core yarn delivery mechanism for rotation about said center axis thereof.

4,309,868

ROTATING RING FOR SPINNING AND TWISTING MACHINES

Oscar Grossi, Bologna, Italy, assignor to Officine Savio S.p.A., Pordenone, Italy

Filed Oct. 23, 1978, Ser. No. 953,522
Int. Cl.³ D01H *7/56*
U.S. Cl. 57—124 **7 Claims**



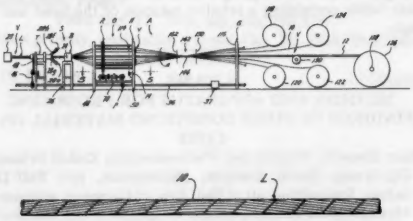
1. An apparatus for guiding yarn towards a spool for use in connection with textile and twisting machines having at least one spindle substantially concentrically disposed within a fixed ring, a co-axial ring rotatably carried by the fixed ring, and an eyelet carried by the co-axial ring, the eyelet including a hook portion at one end of the eyelet and an arm spaced from the hook portion and defining an other end of the eyelet, the improvement to the co-axial ring and the eyelet comprising a radially oriented slot formed in the co-axial ring through which the arm of the eyelet extends in a generally radial direction, the arm having a substantially constant cross-section, the hook being generally radially inward of the co-axial ring, the slot having a vertical extent parallel to the axis of the co-axial ring only slightly larger than the cross-section of the arm and a horizontal extent along the arc of the co-axial ring which sufficiently exceeds the cross-section of the arm so as to permit a reorientation of the arm and therewith of the eyelet relative to the slot and the co-axial ring while the eyelet remains at all times in planes substantially parallel to the axis of rotation of the co-axial ring, whereby the eyelet can orient itself into positions substantially tangent to varying diameters relative to the winding diameter of the yarn on the spool to minimize friction between the eyelet and the yarn being wound onto the spool.

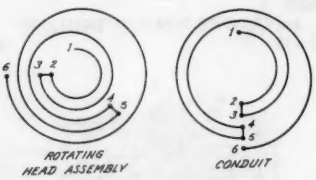
4,309,869

METHOD AND APPARATUS FOR FORMING A NON-TENSIONED MULTI-CONDUIT LINE

Jennings A. Boyce, Magnolia, Tex., assignor to Multiflex, Inc., Magnolia, Tex.

Continuation of Ser. No. 1,421, Jan. 8, 1979, abandoned. This application Jul. 18, 1980, Ser. No. 170,059
Int. Cl.³ D01N *5/00*; F16L *9/18*; B29C *19/00*; F16L *13/04*
U.S. Cl. 57—293 **12 Claims**





1. A method for forming a non-tensioned multi-conduit line from a plurality of conduits and a central core as the plurality of conduits and the central core are pulled longitudinally along the lengths thereof from fixed payout reels, comprising the steps of:

positioning a plurality of conduits longitudinally parallel to and surrounding the central core with the conduits disposed in a cylindrical relationship about the central core;

longitudinally moving the central core without rotation and simultaneously longitudinally moving the plurality of conduits with the central core;

oscillating the plurality of conduits about the central core while moving the conduits longitudinally with the central core, said oscillating of the conduits including alternately rotating the conduits in one rotational direction about the central core an amount greater than 360°, then reversing the direction of said rotating of the conduits in an amount greater than 360°;

frictionally engaging the central core with the conduits prior to said reversing and disengaging said frictionally engaging of the central core with the conduits after said reversing during said oscillating of the conduits about the central core;

repeating said oscillating in succession about the central core as the central core and conduits are moved longitudinally to lay the conduits in contact with the central core in

alternating non-twisted helical lays of substantially 360° in each rotational direction; and,

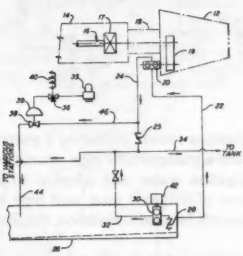
securing the plurality of conduits in a non-twisted, contacting condition about the central core.

4,309,870

LUBRICATING SYSTEM FOR A TURBOMACHINE INCLUDING A METHOD OF OPERATING SAME

Neil A. Guest, Jeannette, and James F. Krisner, Latrobe, both of Pa., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,641
Int. Cl.³ F02C 7/06
U.S. Cl. 60—39.08 **2 Claims**



1. A lubrication system for a turbomachine comprising:

means defining a lubricating oil reservoir;

primary pump means operatively connected to the rotor of the turbomachine and having an inlet connected to said oil reservoir and an outlet connected to portions of said turbomachine requiring lubricating oil for lubrication purposes;

independently driven standby pump means having an inlet connected to said oil reservoir and an outlet connected to portions of said turbomachine requiring lubricating oil for purposes;

bypass means including valve means connected to the primary pump means outlet for selectively connecting said outlet to said reservoir; and

means to activate said standby pump means including means for sensing that said primary pump means is unable to supply sufficient quantities of lubricating oil to said turbomachine, said activating means further including means to open said bypass means.

4,309,871

CONTROL APPARATUS FOR CONTROLLING SURGE IN AIR COMPRESSOR-DRIVEN SYSTEM

Harry J. Venema, Wheaton, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 847,634, Nov. 1, 1977, abandoned. This application Feb. 25, 1980, Ser. No. 124,400
Int. Cl.³ F02C 9/26
U.S. Cl. 60—39.28 R **8 Claims**

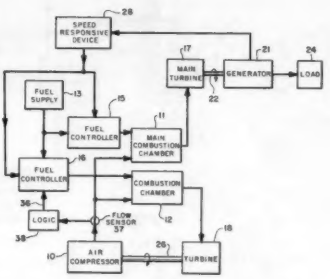
1. Control apparatus for dynamically controlling surge in a system wherein an air compressor drives a variable load and wherein compressed air from the compressor is supplied, along with fuel, to a combustion chamber to produce hot gas for driving a turbine which in turn rotates the compressor, the discharge pressure of the compressed air at the compressor outlet varying as a function of the discharge flow rate, the discharge pressure versus flow rate plot being divided into surge and non-surge regions, comprising:

load responsive means for adjusting the fuel flow to the combustion chamber to vary the compressor speed to establish the flow rate of the compressed air at the steady state operating point needed to satisfy the load demand, the operating point being in either the surge or non-surge region of the pressure-flow plot depending on the load demand;

sensing means for sensing a predetermined parameter which is subject to substantial variations if surging occurs;

means, responsive to said sensing means, for developing a feedback signal which is a function of said predetermined parameter;

and regulating means responsive to said feedback signal for varying the fuel flow to the combustion chamber to dynamically change the speed of the compressor to vary the instantaneous operating point, on the compressor's discharge pressure versus flow rate characteristic curve, alternately back and forth around the steady state operating point and to impart a negative slope to the portion of the pressure-flow characteristic curve over which the instantaneous operating point dynamically varies, thereby preventing surge and stabilizing the operation of the system even when the steady state operating point lies within the surge region of the pressure-flow plot.



4,309,872

BELLOWSLIKE THERMODYNAMIC RECIPROCATING APPARATUS

Richard A. Raser, and William H. Raser, both of 6451 W. 83rd St., Los Angeles, Calif. 90045

Filed Dec. 26, 1979, Ser. No. 107,252
Int. Cl.³ F02G 1/04
U.S. Cl. 60—517 **10 Claims**

1. In an engine, bellowslike apparatus which couples cyclic thermodynamic changes in a fluid to a reciprocating mechanical motion, comprising:

base means;

a bowl-shaped array of resiliently overlapping flexed petals;

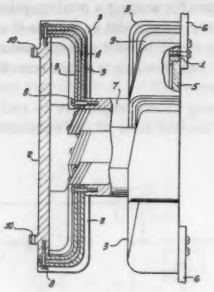
means for attaching one end of each of the petals to a corresponding surface on the perimeter of said base means;

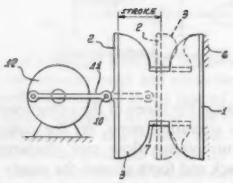
movable structure capable of reciprocating translation relative to said base means;

means for attaching the other end of each of the petals to said movable structure; and

a resilient sealing means which forms a hermetic confinement of the volume bounded by said base means, said

movable structure, said petal array and its attaching means and which permits a greater volume change and a larger





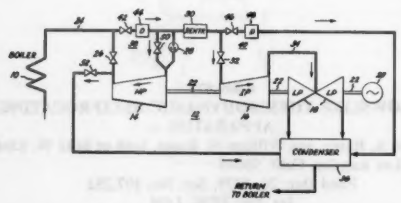
reciprocating mechanical stroke than would be possible if petal overlap distances were fixed.

4,309,873

METHOD AND FLOW SYSTEM FOR THE CONTROL OF TURBINE TEMPERATURES DURING BYPASS OPERATION

Kenneth W. Koran, Ballston Lake, and William T. Parry, Saratoga Spring, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 19, 1979, Ser. No. 105,019
Int. Cl.³ F01K *13/00*
U.S. Cl. 60—646 **9 Claims**



1. A method for operating a steam turbine adapted for bypass mode operation in conjunction with a steam generating means, the turbine having a high-pressure (HP) section, an HP bypass system, at least one lower pressure section, and a lower pressure bypass system, said method comprising the steps of:

bypassing a flow of steam from said steam generating means around said HP section;

admitting a first portion of said bypassed steam to said lower pressure section in a forward flow direction to provide motive fluid for driving the turbine, said first portion of steam being admitted at a rate sufficient to limit rotation loss heating in said lower pressure section; and

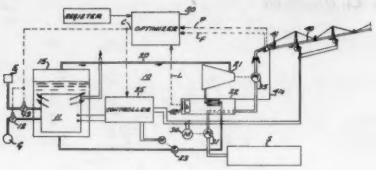
admitting a second portion of said bypassed steam to said HP section to pass therethrough in a reverse-flow direction to limit rotation loss heating in said HP section and to provide an offsetting braking effect for said first portion of steam admitted to said lower pressure section in excess of that required for driving the turbine.

4,309,874

FUEL CELL POWERED IRRIGATION SYSTEM

Edgar F. Jacobi, Jr., 1027 Woodland Pl., Menasha, Wis. 54952, and Mark R. Madden, Rte. #2, Plainsfield, Wis. 54966

Filed Mar. 7, 1980, Ser. No. 128,041
Int. Cl.³ F01K *17/00*
U.S. Cl. 60—648 **4 Claims**



1. In an irrigation system including a source of pressurized irrigation water, a transportable pipe system connected to said source of irrigation water and adapted to translate over a preselected area of irrigated land, said pipe system including motorized supports for said translation, the improvement comprising:

a fuel cell conformed to combine fuel and air for generating electrical excitation in the course thereof and heat by products associated with said combination;

a boiler formed around said fuel cell for heating water by said heat by products and for producing steam therefrom;

a steam driven power plant connected to receive the steam products from said boiler for producing a rotary output, said power plant including a condenser for condensing said steam;

recirculating means connected between said condenser and said boiler for returning the steam condensate;

a first pump connected to be powered by the electrical excitation from said fuel cell for conveying water from said source to the exterior of said condenser for exchanging heat thereat; and

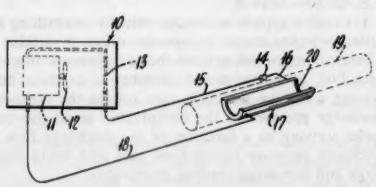
a second pump connected between the exterior of said condenser and said irrigation pipe system and driven by said rotary output for conveying water therebetween.

4,309,875

PIPE FREEZER OR THE LIKE

Arthur Radichio, Hempstead, N.Y., assignor to Gerald M. D'Agostino, Roslyn Heights, N.Y., a part interest

Continuation of Ser. No. 39,068, May 14, 1979, abandoned. This application Sep. 2, 1980, Ser. No. 183,474
Int. Cl.³ F16L *55/16*
U.S. Cl. 62—66 **7 Claims**



1. The combination with a refrigerant unit of pipe freezing apparatus comprising a pipe freezer, means connecting the freezer to the refrigeration unit for passing a refrigerant in the

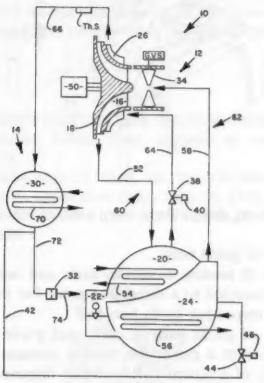
gaseous state through the freezer and back to the refrigeration unit, and means constituting tap water interposed between the pipe and the freezer and frozen in situ by the cold from the freezer for transferring cold from the refrigerant and the freezer to the pipe while maintaining the freezer out of contact with the pipe.

4,309,876

METHOD AND APPARATUS FOR SATISFYING HEATING AND COOLING DEMANDS AND CONTROL THEREFOR

Gary S. Leonard, Minoa, and Thomas M. Zinsmeyer, Pennellville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 22, 1979, Ser. No. 87,290
Int. Cl.³ F25B *7/00, 5/00*
U.S. Cl. 62—79 **20 Claims**



1. Apparatus for satisfying heating and cooling demands comprising:

a cooling circuit for satisfying the cooling demand and including a high pressure side and a low pressure side;

a heating circuit for satisfying the heating demand and including

a booster compressor for drawing and compressing refrigerant vapor from the high pressure side of the cooling circuit, and

return means for returning refrigerant from the heating circuit to the cooling circuit;

a sensor for sensing the temperature of vapor discharged from the booster compressor; and

means responsive to the sensor for terminating the heating action of the heating circuit when the temperature of the vapor discharged from the booster compressor exceeds a preset temperature, the terminating means including

means for reducing the vapor flow rate through the heating circuit, and

means for venting vapor in the heating circuit to a low pressure region to lower the pressure of vapor in the heating circuit.

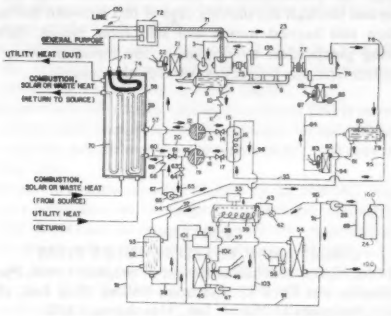
4,309,877

TOTAL ENERGY SYSTEM INCLUDING MEANS FOR UTILIZING SUPPLEMENTARY HEATS

Ian S. Tawse, Downsview, Canada, assignor to Co-Gen, Inc., Miami, Fla.

Filed Sep. 8, 1980, Ser. No. 185,358
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.1 **12 Claims**

1. An improved total energy system including means for utilizing supplementary heats and comprising, in combination: an electrical generator for the supply of electrical energy; a heat engine for driving said electric generator; means for collecting a portion of the waste heats of said heat engine; a heat operated air conditioning means; means for conveying said waste heats from said heat collecting means to said heat-operated air conditioning means for the purpose of supplying motive energy for said heat-operated air conditioning means; a heat storage means; means for conveying heat from said heat collecting means to said heat storage means; means for conveying heat from said stor-


LINE
GENERAL PURPOSE
UTILITY HEAT (OUT)
COMBUSTION, SOLAR OR WASTE HEAT (RETURN TO SOURCE)
COMBUSTION, SOLAR OR WASTE HEAT (FROM SOURCE)
UTILITY HEAT (RETURN)

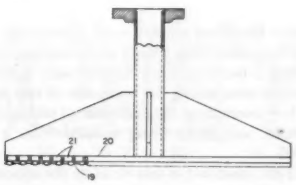
age means to said heat-operated air conditioning means; means for conveying heat from said storage means to a medium to be heated such as water in a building's hydronic heating system; means for transferring to the said heat storage means, heats supplementary to heats generated within the claimed total energy system, said heats having been transferred to said heat storage means then becoming available for purposes of utilitarian heating and the operation of a heat-operated air conditioning system.

4,309,878

PROCESS AND APPARATUS FOR SEPARATING AND PURIFYING A CRYSTALLINE MATERIAL

Earl D. Brennan, Monroeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Aug. 22, 1980, Ser. No. 180,308
Int. Cl.³ B01D *9/02*
U.S. Cl. 62—542 **9 Claims**



6. A process for purifying and separating a crystalline compound from its impurities in a slurry containing same comprising introducing said slurry under pressure into a cylindrical pressurized filter-washer having a substantially constant inside diameter which is substantially free of protrusions, said filter-washer having a filter means with a screen contiguous with an internal surface of the cylinder, said screen having a smooth surface sufficient to provide minimum friction so as to allow a moving bed of crystals to move past it and withdraw a filtrate without blinding, filtering the crystals, withdrawing the filtrate, and moving the crystal bed past the filter screen, applying a controlled restraining force on the crystal bed so as to prevent relaxation and channeling and over-compacting of said bed by means of a compression and harvest means substantially contiguous with said inside diameter and located between said

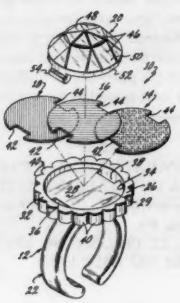
filter means and an exit means, said compression and harvest means comprising a rotatable plate with cutting edges for removing crystals from said bed and perforations for receiving crystals to be passed through said plate to a melting zone, rotating said plate to pass crystals through said perforations, melting the harvested crystals in said melting zone and withdrawing a portion of said melted crystals as purified product from said exit means located in said melting zone, passing the balance of said melted crystals in a countercurrent manner through the perforations in said compression and harvest means and through the moving crystal bed between said compression and harvest means and said filter means, thereby effecting purification by displacing the liquid medium and impurities from the interstices between the crystals.

4,309,879

CHILD'S SIMULATED JEWELRY ITEM

Bonita M. Gretz, Manhattan Beach; J. Stephen Lewis, Pacific Palisades, and Cyril G. Shireman, Rolling Hills Est., all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Sep. 29, 1980, Ser. No. 191,985
Int. Cl.³ A44C *17/02*
U.S. Cl. 63—29 R **2 Claims**



1. A child's simulated jewelry item, comprising:

a unitary body including a band of opened, generally circular shape, a bezel having a bottom wall, a collar at least partially encompassing the upperside of said bottom wall and a boss connecting the underside of said bottom wall to said band, said body being molded from a polymeric material;

a colored disc mounted in said bezel on the upperside of said bottom wall;

a clear, plastic simulated gem mounted in said bezel on top of said disc, whereby said disc will impart its color to said simulated gem; and

means for mounting said simulated gem in said bezel in a manner such that a small child cannot remove said simulated gem from said bezel, comprising:

a pair of elongated openings in said bottom wall closely adjacent said collar, said openings being spaced approximately 180° apart; and

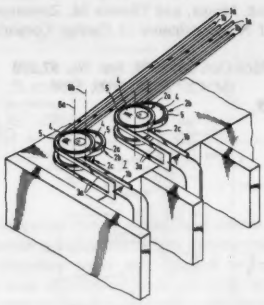
a pair of J-shaped clips depending from said simulated gem, said clips being constructed and arranged in a manner such that each clip may be inserted through an associated one of said openings, whereupon said clips will spring outwardly into locking engagement with the underside of said collar.

4,309,880

PATTERNING DEVICE FOR A WARP KNITTING MACHINE

Peter Riesen, Elgg, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed May 19, 1980, Ser. No. 150,907
Claims priority, application Switzerland, Jun. 12, 1979, 5470/79
Int. Cl.³ D04B *23/00*
U.S. Cl. 66—207 **12 Claims**



1. A patterning device for a warp knitting machine comprising

a plurality of guide bars;

a plurality of tension elements, each said tension element being connected to a respective guide bar for reciprocating said respective guide bar; and

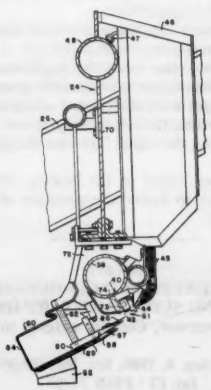
a plurality of guide pulleys, each said guide pulley being disposed with a respective tension element thereon and each pair of adjacent pulleys being disposed in overlapping relation to each other.

4,309,881

APPARATUS FOR THE APPLICATION OF LIQUIDS TO MOVING MATERIALS

Victor W. Kimble, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 21, 1980, Ser. No. 142,232
Int. Cl.³ D06B *1/02*
U.S. Cl. 68—205 R **6 Claims**



1. Apparatus for applying liquids to moving material including means for conveying the material in a predetermined path of travel, liquid applicator means having a row of outlets

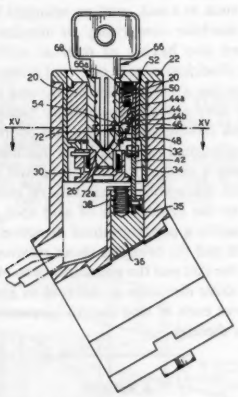
positioned above the path of travel of the material for continuously discharging along respective discharge axes of said outlets a corresponding row of generally parallel streams of liquid downwardly toward the path of travel of the material, means for discharging a deflecting fluid along a plurality of discharge axes to selectively deflect the streams of liquid from said outlets away from the path of travel of the material, said liquid deflecting means being positioned on one side of said row of outlets so that discharge axes of said deflecting means intersect the discharge axes of the outlets, and a liquid collection chamber positioned on the other side of the discharge axes of the row of outlets from said liquid deflecting means, said liquid collection chamber having an opening extending along the row of outlets for receiving the deflected liquid streams to prevent their contact with the moving material, said liquid applicator means having a first section and a second section, said second section having a projection thereon with spaced notches formed therein, said liquid deflecting means including a plurality of air tubes biased into said notches, means maintaining said first section into mating relationship with said second section and means maintaining said air tubes into engagement with said notches.

4,309,882

ANTITHEFT DEVICE FOR MOTOR VEHICLES

Guiseppe Maiocco, Rivoli, Italy, assignor to Arman S.p.A., Druento, Italy

Filed May 21, 1980, Ser. No. 151,960
Claims priority, application Italy, May 25, 1979, 68123 A/79
Int. Cl.[3] E05B *27/00, 65/12;* B60R *25/02*
U.S. Cl. 70—186 **12 Claims**



1. An antitheft device for locking the steering shaft, which can be operated by means of a cylinder lock and is provided with a latch which is brought into its locking position by a spring when the ignition key is extracted from the rotating cylinder of the lock, for preventing the rotation of the shaft of the steering wheel of a motor vehicle, a rod associated with said latch, said rod being slidingly mounted in an axial hole of a stationary cylinder, a stop element co-operating with said rod and being axially movable with said rod during the unlocking movement of the latch and radially movable with respect to said rod at the end of the unlocking movement of the latch, a first control member carried by the lock and projecting in said axial hole of the stationary cylinder, a second control member carried by said rod, the relative position of said stop element with respect to one of the two control members depending on the presence of the key in the lock and said stop element preventing the accidental movement of the latch into its locking position when the key is inserted in the rotating cylinder of the lock, characterized in that:

the stop element consists of a ball (46) inserted between the rod (42) of the latch (36,60) and the rotating cylinder (24,68) of the lock,

the cylindrical surface of the rotating cylinder (24,68) is provided with a first substantially hemispherical cavity or recess (54) extending into the key slot (26) and a second substantially hemispherical cavity or recess (56) angularly displaced and axially positioned towards the upper end portion of the rotating cylinder (24,68) with respect to the first cavity (54), said cavities (54,56) being able to be engaged by said ball (46), respectively, when the key (28,66) is removed and at the end of the unlocking movement of the latch (36,60),

the first control member carried by the lock is a part (48) of the stationary cylinder (20) adjacent to the lower end portion of the rotating cylinder (24,68),

the axial hole (40) of the stationary cylinder (20) is provided with a reaction surface (50*a*,76*a*) facing the ball (46) on the opposite side of the first control member (48) carried by the lock,

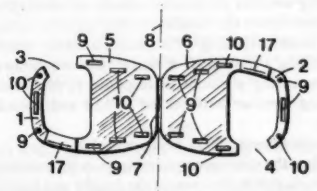
the second control member carried by the rod (42) consists of a projection (44,74) directed towards the rotating cylinder (24,68) and having two respectively upper and lower inclined surfaces (44*a*,44*b*; 74*a*,74*b*) converging towards the free end of said projection (44,74), the upper inclined surface (44*a*,74*a*) bearing against the ball (46) during the unlocking movement of the latch (36,60) and the lower inclined surface (44*b*,74*b*) bearing against the ball (46) at the end of said unlocking movement, said ball (46) moves from the upper inclined surface (44*a*,74*a*) to the lower inclined surface (44*b*,74*b*) over the free end of said projection (44,74) when the ball (46) seats in the second cavity (56) of the rotating cylinder (24,68) and under the action of said reaction surface (50*a*,76*a*).

4,309,883

RING FOR ATTACHMENT TO KEYS OR OTHER OBJECTS

Attilio Brentini, "Le Chateau", Crissier (Vaud), Switzerland

Continuation-in-part of Ser. No. 940,854, Sep. 8, 1978, abandoned. This application Jul. 23, 1979, Ser. No. 60,211
Claims priority, application Switzerland, Mar. 3, 1978, 2316/78
Int. Cl.[3] A44B *15/00;* A45C *13/42*
U.S. Cl. 70—456 R **4 Claims**



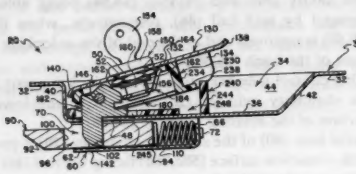
1. A two part article including a ring, each said part including a flat body portion and an annular part extending from the body portion to define an open area, hinge means connecting said body portions at a point opposite said annular parts, each annular part having a gap therein, male and female attachment means on each said body portion and each said annular part, said attachment means comprising at least one groove and at least one projection on each said body portion and each said annular part, said gaps located on each of said annular parts in such a position that when said parts are folded along said hinge means toward each other and pressed together, said male and female attachment means are connected and each gap overlies an unopen section of the facing annular part to thereby provide a closed ring.

4,309,884

PADDLE LOCK WITH GUARD-PROTECTED HANDLE DISCONNECT MEMBER

Edwin W. Davis, Medina, Ohio, assignor to The Eastern Company, Cleveland, Ohio

Filed Dec. 28, 1979, Ser. No. 107,858
Int. Cl.[3] E05B 55/04
U.S. Cl. 70—472 30 Claims



1. A door lock, comprising:

(a) a body structure;

(b) a bolt structure connected to the body structure for movement between latching and unlatching positions, the bolt structure having a connecting formation connected thereto for movement along a first path of travel relative to the body structure in response to movement of the bolt structure between its latching and unlatching positions;

(c) a handle structure connected to the body structure for movement between normal and operating positions;

(d) key control means connected to the handle structure and having a locking member which is movable relative to the handle structure between locked and unlocked positions, the key control means being operable to selectively retain the locking member in its locked and unlocked positions;

(e) operating means having an operating formation connected thereto for movement between first and second positions along a second path of travel relative to the body structure, and being operable to drivingly engage the connecting formation to effect movement of the bolt structure from its latching position to its unlatching position in response to movement of the operating formation from its first position to its second position;

(f) disconnect means interposed between the operating means and the locking member for selectively drivingly connecting and disconnecting the operating means and the locking member to thereby selectively drivingly connect and disconnect the handle and bolt structures, the disconnect means including a disconnect member which is movable along a third path of travel between connecting and disconnecting positions in response to movement of the locking member between its locked and unlocked positions;

(g) the disconnect means being operable:

(i) when the disconnect member is in its connecting position, to drivingly connect the handle and bolt structures such that, when the handle structure is caused to move to its unlatching position; and,

(ii) when the disconnect member is in its disconnecting position, to disengage the operating means at a location between the handle and body structures to thereby provide no driving connection between the handle and bolt structures, whereby the handle structure may be moved freely between its normal and operating positions without causing corresponding movement of the bolt structure; and,

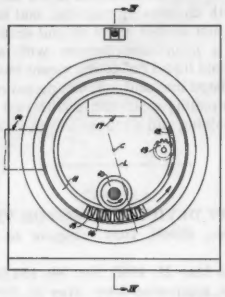
(h) guard means including a pair of overlying guard formations interposed between the handle structure and the body structure for preventing intruder access to said location, each of the guard formations being movable relative to the other as the handle structure moves relative to the body structure.

4,309,885

MACHINE FOR FORMING A HEAD ON A SHANK, SUCH AS A NAIL OR A SCREW

Ove Nielsen, Horsholm; Leif Nielsen, Ballerup, and Tarras Wanheim, Copenhagen, all of Denmark, assignors to Aktieselskabet Nordiske Kabel- og Traadfabriker, Copenhagen, Denmark

Continuation of Ser. No. 13,114, Feb. 21, 1979, abandoned. This application Oct. 30, 1980, Ser. No. 202,089
Claims priority, application Denmark, Feb. 23, 1978, 819/78
Int. Cl.[3] B21G 3/12, 3/28, 3/30, 3/32
U.S. Cl. 72—197 14 Claims



1. A machine for providing a shank of substantially uniform cross-section, such as a nail, with an enlarged head at one end thereof, said machine comprising an annular tool having a central axis and also having an internal surface bounding a substantially cylindrical space, said tool being provided with means for receiving a plurality of shanks and for securing the shanks so that they extend substantially radially of said tool with each shank having its said one end protruding into said substantially cylindrical space, and the machine also comprising a roll having a central axis and mounted in said substantially cylindrical space with its central axis extending substantially parallel to the central axis of said tool, and means for rotating said tool in a predetermined direction about the central axis thereof and for bringing about relative rolling movement between the roll and the annular tool to effect rotation of the roll in the same direction as the tool to enable the roll to press on said one ends of said shanks successively to provide enlarged heads thereon.

4,309,886

PROCESS FOR PRODUCING STEEL STRIP MATERIAL FOR USE IN MANUFACTURE OF SHADOW MASK OF BRAUN TUBE FOR COLOR TV

Michio Kubota, Amagasaki; Takeshi Tsuda, Takatsuki; Masahiro Shimose; Kazuhiro Takagi, both of Amagasaki; Yasuo Imamura, Urawa, and Kazunori Kato, Tokyo, all of Japan, assignors to Nisshin Steel Co., Ltd. and Dai Nippon Printing Co., Ltd., both of Tokyo, Japan

Filed Oct. 11, 1979, Ser. No. 83,634
Claims priority, application Japan, Oct. 18, 1978, 53-128030
Int. Cl.[3] B21B 1/00, 3/02
U.S. Cl. 72—202 3 Claims

1. A process for producing a strip of steel suitable for use in the manufacture of a shadow mask for the Braun tube of a color television receiver, which comprises:

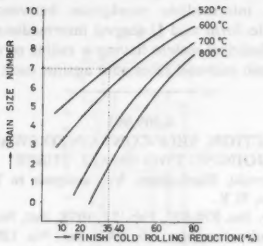
providing a strip of low carbon steel having not more than 0.08 percent by weight of carbon;

subjecting the provided strip to a cold rolling reduction of 10 to 35 percent to obtain a finished strip of not more than 0.2 mm in thickness;

annealing the rolled strip, in the form of a tightly wound

coil, at a temperature of from 520° to 600° C. for a period of at least 2 hours; and

subjecting the annealed strip to conditioning by rolling until a reduction of 0.3 to 0.8 percent in thickness occurs;



whereby there is obtained a steel strip wherein the steel has a grain size number of 4 to 7 and a coercive force of not greater than 2.0 Oersted as measured with the initial magnetizing field of 25 Oersted.

4,309,887

PRODUCTION OF COPPER TUBING

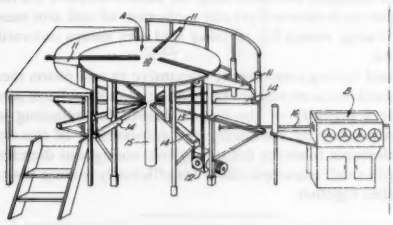
Douglas K. Judd, Penrith, Australia, assignor to Crane Enfield Metals Pty. Limited, Australia

Filed Aug. 6, 1979, Ser. No. 63,987

Claims priority, application Australia, Aug. 7, 1978, PD5399

Int. Cl.³ B21C *1/00, 47/26*

U.S. Cl. 72—280 **4 Claims**



1. Apparatus for the continuous production of half hard copper tubing, comprising coil supporting means for supporting a first coil of copper tubing and a second coil of copper tubing including means for transferring the second coil to the position previously occupied by the first upon said first coil being drawn off, coil accumulator means for intermittently accumulating tubing in coiled form while providing a continuous supply of stored tubing, tube treatment apparatus including annealing means and quenching means, first means for drawing off said first coil of tubing and transferring the same to said coil accumulator means, second means for continuously drawing off tubing from said coil accumulator means and feeding the same to said annealing means, and thence to said quenching means, and means for stopping and starting said first drawing off means.

4,309,888

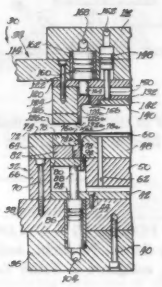
APPARATUS FOR FORMING A CONTAINER PAN

Roland E. Miller, Orangeville; Joseph A. Scaletta, Mount Prospect, and John Valek, Cicero, all of Ill., assignors to Kraftco Corporation, Glenview, Ill.

Division of Ser. No. 707,821, Jul. 22, 1976, Pat. No. 4,185,488. This application Jun. 4, 1979, Ser. No. 44,979

Int. Cl.³ B21D *28/00*

U.S. Cl. 72—334 **7 Claims**



1. Apparatus for forming a rectangular container pan having a bottom surface and upstanding side walls interconnected through smooth radially curved corner walls, said apparatus comprising, in combination, die set means including a lower die holder and an upper punch holder, said lower die holder having means for supporting a blank from which the container pan is formed, means including opposed fluid pressure operated clamping members adapted to clamp the full peripheral surface of said blank, forming die means carried by said lower die holder and said upper punch holder and cooperative to engage opposite surfaces of said blank and draw the clamped blank between said clamping members so as to simultaneously form the bottom and side and corner walls such that the side and corner walls are formed from portions of the blank drawn between said clamping members, and means for controlling the clamping force on the peripheral surface of the blank at the portions of said blank drawn to form said side and corner walls, said control means being operative during a first draw operation to establish a substantially constant clamping force on the portions of the blank forming the side walls during forming of said bottom and side and corner walls, said control means being operative to establish a substantially constant clamping force on the portions of the blank which form the corner walls of said pan which is less than the clamping force applied to the portions of the blank which form the side walls.

4,309,889

METHOD AND APPARATUS FOR THE FORMING OF A SERIES OF TROUGHS INTO A METAL FOIL STRIP

Guenther Kaupert, Thueringer Str. 1, Erndtebrueck, Fed. Rep. of Germany (5927)

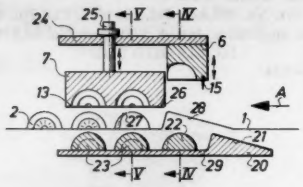
Division of Ser. No. 859,457, Dec. 12, 1977, Pat. No. 4,241,599. This application Nov. 15, 1979, Ser. No. 94,655

Int. Cl.³ B21D *22/06*

U.S. Cl. 72—356 **6 Claims**

1. An apparatus for the stepwise forming into a metal foil strip of a series of elongated troughs extending with their length across said strip and having different cross-sections at their opposite ends, said apparatus comprising: a series of sets of upper (female) and lower (male) pre-forming, and at least two sets of final forming dies adapted to receive therebetween said metal strip for forming said troughs into said strip while said strip is intermittently advanced from set to set, said pre-forming dies having end faces of essentially the same size corresponding to the larger of the ends of the trough so as to form a preliminary trough with equal width and depth at its

ends and the first of the final forming dies being smaller at one end, at least one of said final forming dies having means for pleating the side walls of said troughs at said smaller end so as



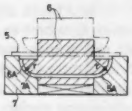
to reduce the size of the trough formed in the pre-forming die while the strip is held in position in the last of the final forming dies.

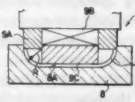
4,309,890

METHOD OF FORMING A CYLINDRICAL MEMBER

Shigeo Ichikawa; Satoru Nomichi, and Masaki Sinoda, all of Toyota, Japan, assignors to Taiho Kogyo Co., Ltd., Toyota, Japan

Filed Oct. 11, 1979, Ser. No. 84,033
Claims priority, application Japan, Oct. 16, 1978, 53-127016
Int. Cl.³ B21C *37/06*; B21D *53/10*
U.S. Cl. 72—368 **7 Claims**





1. A method of forming a cylindrical article having a radius of curvature R, which comprises the steps of:

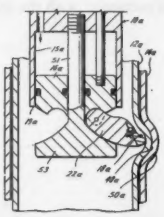
in a first, bending step, bending upwardly the end portions of a flat, rectangular sheet to form said end portions into arcuate shapes whereby to obtain an intermediate workpiece having a substantially flat central portion and a pair of arcuate, end portions extending upwardly at the ends of said substantially flat central portion, the edges of said arcuate end portions facing upwardly; then coining said arcuate end portions of said intermediate workpiece by placing said intermediate workpiece in a die cavity having a substantially flat bottom wall and a pair of arcuate end walls at the end of said flat bottom wall, said end walls each having a radius of curvature substantially equal to or slightly greater than the radius of curvature R of said cylindrical article, and simultaneously pressing downwardly on the upwardly facing edges of said arcuate end portions to further bend said arcuate end portions of said intermediate workpiece to conform the outer surfaces of said arcuate end portions to the shape of said end walls of said die cavity so that said arcuate end portions of said coined intermediate workpiece have uniform radii of curvature substantially equal to or slightly greater than the radius of curvature of said cylindrical article; then bending the central portion of said coined intermediate workpiece to form same into a U shape in which the edges of said arcuate end portions substantially face each other; and then placing the U-shaped intermediate workpiece between a pair of dies having semi-cylindrical surfaces which mate to define a cylindrical cavity and pressing said U-shaped intermediate workpiece between said dies whereby to form said U-shaped intermediate workpiece into a cylindrical article having a radius of curvature R and wherein said end faces abut against each other.

4,309,891

DOUBLE ACTION, SELF-CONTAINED SWAGES FOR JOINING TWO SMALL TUBES

Ivo C. Pogonowski, Blacksburg, Va., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 878,625, Feb. 17, 1978, Pat. No. 4,220,034.
This application Mar. 10, 1980, Ser. No. 128,752
Int. Cl.³ B21D *41/00*; B21J *7/16*
U.S. Cl. 72—399 **5 Claims**



1. A swage for deforming and joining together two small telescopic tubes having a longitudinal axis comprising,

(a) cylinder means for being positioned coaxially in the telescopic tubes having a piston means operable in one end of the cylinder means,

(b) arm means having one end pivotally connected to said piston means for being moved longitudinally in the cylinder,

(c) the other end of the arm means carries an indentation tip for engaging and deforming the inner surface of the inner tube upon outward pivotal movement of said arm means,

(d) biasing means for pivoting said arm means outwardly, and

(e) said biasing means being responsive to said piston means longitudinal movement for bearing against said arm means for a majority of the length thereof for actuating said indentation tip outwardly and transversely of the small telescopic tubes for deforming two contiguous dimples in both small telescopic tubes for efficiently joining the two tubes together.

4,309,892

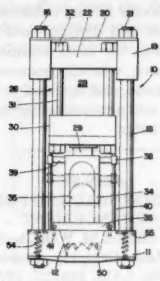
CRIMPING MACHINE

William E. Currie, Cleveland Heights, Ohio, assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Apr. 30, 1980, Ser. No. 145,158
Int. Cl.³ B21D *41/04*
U.S. Cl. 72—402 **20 Claims**

1. A crimper assembly for crimping the socket of a hose fitting onto a hose end within a die block having a tapered bore therein comprising, a plurality of die segments for crimping the socket of a hose fitting, said die segments having an outer surface conforming to the bore of said die block and an inner surface for crimping said hose fitting, means connecting adjacent die segments for limited relative movement to facilitate placement and removal of said die segments to and from said die block, said die segments being positioned in said die block

in a circular array adapted to encircle the socket of a hose fitting positioned therein, a die separator, means for permitting axial movement of the die separator relative to said die segments, said die separator supporting said die segments in said die block in a first position therein adapted for receipt of said



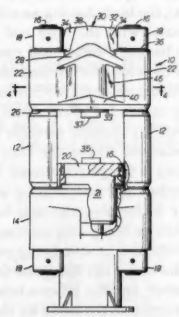
hose fitting, said die separator engaging each of said die segments to position same in a symmetrical and spaced circular array, and means for urging said die segments simultaneously into said die block with said outer surface in engagement with said tapered bore.

4,309,893

PLUG-SHAPED PRESS CROWN FOR A PRESS ASSEMBLY

Erwin R. Mueller, Milwaukee, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Aug. 27, 1979, Ser. No. 70,381
Int. Cl.³ B21J *13/04*
U.S. Cl. 72—455 **4 Claims**



1. A press assembly for reducing the transverse forces acting upon the tooling apparatus thereof due to deflection induced in the press crown thereof when said assembly is under load, said assembly comprising:

a. said press crown,

b. a force member including a movable platen,

c. said tooling apparatus including paired die members, one die member secured to said platen and the other to the surface of said press crown facing said platen, and

d. a plurality of tying members tying said assembly together;

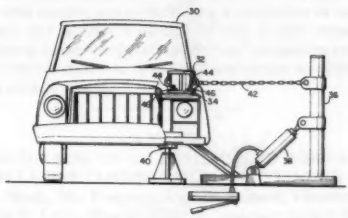
said press crown further comprising a central portion of a predetermined vertical section, a plurality of lug portions adapted to be secured to said tying members, and a transitional portion of a vertical section less than that of said central portion, said transitional portion comprising a plurality of arms each extending from a respective lug portion to said central portion and integral with said central and lug portions, said arms lying a greater horizontal distance from the central longitudinal axis of the press assembly than said tooling apparatus.

4,309,894

AUTO BODY REPAIR TOOL

Marc A. Connor, 4348 Rustlewood La., Doraville, Ga. 30360

Filed Nov. 5, 1979, Ser. No. 91,683
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—457 **5 Claims**



1. An apparatus for repairing vehicles of the type utilizing unitized body and frame construction having McPhearson struts and the like which include upwardly extending bolts which vary in arrangement among the vehicles, said apparatus comprising:

a first flange having a plurality of holes spaced to conform to at least one arrangement of said bolts, for connection to the strut and for connection to a force exerting means;

a shank member rigidly connected to and extending from the first flange, the shank member having means for connection to a force exerting means; and,

a second flange rigidly connected to the shank member opposite said first flange and having a plurality of holes spaced to conform to at least a second arrangement of said bolts and for connection to a force exerting means;

whereby the apparatus may be attached to the struts of any of said vehicles by one of said flanges and whereby forces may be applied to the apparatus at a plurality of points on the shank member and the other, unconnected flange.

4,309,895

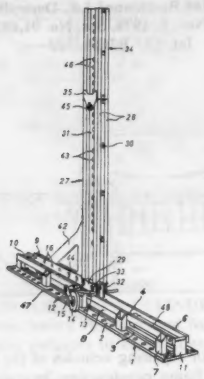
ARRANGEMENT FOR STRAIGHTENING DAMAGED VEHICLE BODIES

Mökjas J. Samuelsson, Örebro, Sweden, assignor to Josam Lastbilteknik AB, Örebro, Sweden

Continuation of Ser. No. 957,284, Nov. 2, 1978. This application Mar. 6, 1981, Ser. No. 241,207
Claims priority, application Sweden, Nov. 3, 1977, 7712423
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—457 **3 Claims**

1. An apparatus for straightening damaged vehicle bodies, comprising a transportable elongate alignment bar having pivotally mounted wheels operable to raise and lower the alignment bar between a working position in abutment with a supporting surface and a transport position, said alignment bar defining a longitudinal center line and being adapted to be fastened to said supporting surface in said working position and comprising a base plate having at least two upright wall elements attached rigidly thereto, said base plate and said wall elements together forming a substantially U-shaped profile in cross-section defining a guideway, extending longitudinally along the longitudinal center line of the U-shaped structure, for at least one straightening unit, and at least two parallel guideways, one on each side of said axis, each defined by a longitudinal opening between a lower and an upper said upright wall element, said straightening unit comprising at least one upright beam and force generating means attached to said beam and being constructed as a rolling carriage having a longitudinally extending lower part, in the form of an elongate rectangular

tube, between the wall elements, having reinforcing plates rigidly fixed therein and hub casings therein to which are mounted transverse axles which in turn support front and back pairs of rotatable rollers, disposed on the outer sides of the tube, by which the carriage is displaceably mounted in said



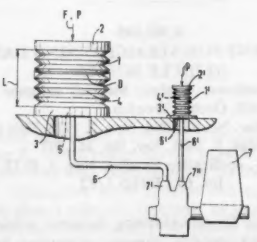
parallel guideways, said carriage being displaceable horizontally under the influence of at least one servo-controlled means located between said upright wall elements, and said at least one servo-controlled means being attached to said alignment bar and having a line of action extending longitudinally between said wall elements.

4,309,896

PICK-UP FOR MEASURING FORCES OR WEIGHT LOADS

Malchair Laurent, Boulevard d'Avroy 55/021, 4000 Liege, Belgium

Filed Apr. 26, 1979, Ser. No. 33,662
Claims priority, application Belgium, Apr. 28, 1978, 46456
Int. Cl.³ G01L *25/00*
U.S. Cl. 73—1 B **6 Claims**



1. A detector for the measurement of forces or loads of weight, comprising

a pressure transducer,

a reception plate means for receiving a force applied,

a support plate,

a rigid body defining a length, said body being incompresible in said length and unchangeable in its cross-section and arranged between said plate means and said support plate,

said body defining a chamber having a peripheral wall defining a chamber containing a liquid means for transforming said force into pressure and for being operatively connected to said pressure transducer,

said reception plate means disposed in said body at a top of said chamber spaced close to said peripheral wall of said body defining a gap around said reception plate means between the latter and said peripheral wall, said gap being small relative to the corresponding dimension of said reception plate means,

a diaphragm means, having an annular membrane portion connected to said body and said reception plate means and enclosing said gap therebetween, for providing flexibility by deformation of said annular membrane portion,

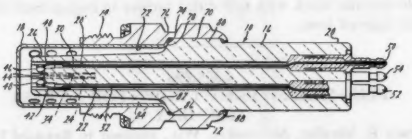
a second of said detector having reduced cross-section compared to the first said detector and connected to said pressure transducer, the latter constituting a differential pressure transducer, whereby measurements with standardization are made, said first and said second detectors are connected to said pressure transducers via two respective inlets of the latter.

4,309,897

EXHAUST GAS SENSOR SEAL AND PROTECTION TUBE ARRANGEMENT

Jerry L. Springer, and Charles M. Wells, both of Livonia, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 5,423, Jan. 22, 1979, abandoned. This application Jul. 7, 1980, Ser. No. 166,729
Int. Cl.³ G01N *27/12*
U.S. Cl. 73—23 **2 Claims**



1. A titania exhaust gas oxygen sensor of the type adapted for installation in a conduit for conveying exhaust gases from an internal combustion engine, the sensor having a body made from a metal material, the body having an axial bore through it, external threads coaxial with the bore and at one end of the body, the body also having a hexagonal exterior portion suitable for engagement by a tool for turning the body, the sensor having a ceramic member received within the bore in the body and the body having means for effecting an axial force acting to form a seal between the ceramic member and the body, and a protection tube received within the bore in the body, the protection tube having a flange positioned between the body and the ceramic member and cooperating with the body and the ceramic member in forming the seal between them, the exhaust gas oxygen sensor being characterized by: a groove in the exterior of the body, the groove being positioned adjacent the seal formed by the body, the flange of the protection tube and the ceramic member, and the groove being separated from the threads on the exterior of the body by the hexagonal exterior portion thereof.

4,309,898

SIGNAL-TO-NOISE RATIO IN CHROMATOGRAPHIC ANALYSIS

Robert L. Horton, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Jun. 19, 1980, Ser. No. 161,179
Int. Cl.³ G01N *31/08*
U.S. Cl. 73—23.1 **19 Claims**

1. Apparatus comprising:

a first chromatographic separating column having a fluid inlet and a fluid outlet;

means for supplying carrier fluid to the fluid inlet of said first chromatographic separating column;

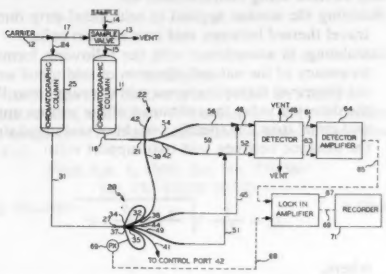
means for injecting a sample into the carrier fluid flowing to the fluid inlet of said first chromatographic separating column;

a flow restriction means having a fluid inlet and a fluid outlet;

means for supplying carrier fluid to the fluid inlet of said flow restriction means;

a detector means capable of measuring a property of a fluid which is characteristic of the fluid, said detector means having first and second fluid inlets;

means for supplying fluid from the fluid outlet of said first chromatographic separating column and the fluid outlet of said flow restriction means alternately to both said first



fluid inlet and said second fluid inlet of said detector means in such a manner that said detector means establishes a first signal, having a frequency F, representative of the response of said detector means when fluid from the fluid outlet of said first chromatographic separating column and fluid from the fluid outlet of said flow restriction means are provided to said detector means; and

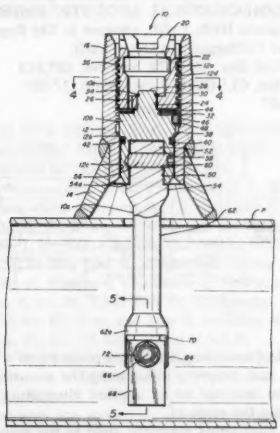
means for amplifying said first signal at said frequency F to improve the signal-to-noise ratio of the response of said detector means.

4,309,899

EQUIPMENT HOLDER

Carlos A. Torres, Brookshire, Tex., assignor to McMurry/-Hughes, Inc., Huntsville, Tex.

Filed Apr. 3, 1979, Ser. No. 26,609
Int. Cl.³ G01N *17/00*
U.S. Cl. 73—86 **48 Claims**



1. Apparatus for use with containers of fluid under pressure comprising:

(a) landing means generally circumscribing a passage communicating with the interior of such a container;

(b) holder means which may be received by said landing means;

(c) anchor means, as part of said holder means, for anchoring said holder means to said landing means by threaded engagement of said anchor means to said landing means;

(d) seal means, as part of said holder means, for fluid-sealing said holder means to said landing means; and

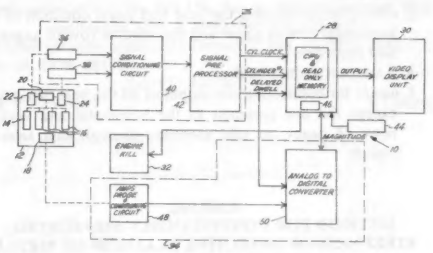
(e) connection means, for coupling said seal means to said anchor means while permitting rotational movement and limited translational movement between said seal means and said anchor means, including a projection of said seal means into at least a portion of said anchor means and retaining means cooperating with said projection and with said anchor means to retain said seal means so coupled to said anchor means.

4,309,900

APPARATUS FOR MEASUREMENT AND DISPLAY OF RELATIVE COMPRESSION BY CYLINDER

Keith A. Kreft, Mt. Prospect; Alan E. Rossetti, Glenview, and Michael F. Lynn, Berwyn, all of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.

Filed Apr. 18, 1980, Ser. No. 141,668
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—117.2 **16 Claims**



12. In a compression test apparatus of the type coupled to an engine wherein a starter current is monitored, said engine including a coil and a starter motor, an improved means for measuring said starter current comprising, in combination:

input means, coupled to said engine, for providing an input signal representative of the firing of said coil, said input signal being a DELAYED DWELL signal related to the firing of said coil; and

sample means, coupled to said starter and said input means, for measuring said starter current in timed relationship to said input signal, whereby said starter current is intermittently sampled in accordance with the firing of said coil.

4,309,901

HEAT TRANSFER CALIBRATION PLATE

Edmund J. Rolinski, Montgomery County, Ohio, and Bernard Laub, Santa Clara County, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 18, 1979, Ser. No. 104,925
Int. Cl.³ G01K *17/06*; G01M *9/00*
U.S. Cl. 73—147 **1 Claim**

1. Apparatus for determining the heat transfer cofficient in a wind tunnel test facility which comprises:

a. a support plate;

b. means for mounting said support plate in the aerodynamic flow of a wind tunnel test facility;

c. a heat conductive plate secured to said support plate;

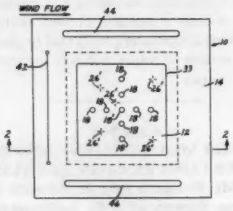
d. means for supplying heat to said conductive plate;

e. a plurality of heat flux gages on said conductive plate for

indicating the heat flux at a plurality of positions on said conductive plate, a portion of said gages being positioned in a horizontal row and a portion of said gages being positioned in a vertical row with one gage common to the horizontal row of gages and the vertical row of gages;

f. a thermocouple connected to said conductive plate for indicating the temperature of said plate;

g. means, connected to said support plate a predetermined distance from said heat flux gages, for changing laminar flow over the surface of the conductive plate to turbulent flow;



h. a recorder;

i. means connecting the output of said thermocouple to said recorder;

j. means for connecting the heat flux gage, common to the horizontal row of gages and the vertical row of gages, to said recorder;

k. a selector switch; and

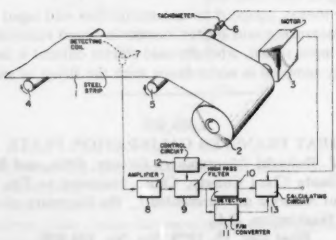
l. means for connecting the output of all the heat flux gages, except the one common to the horizontal and vertical rows of gages, to said recorder through said selector switch.

4,309,902

METHOD FOR CONTINUOUSLY MEASURING STEEPNESS OF DEFECTIVE FLATNESS OF METAL STRIP DURING ROLLING

Kazuo Sano; Katsujiro Watanabe, both of Tokyo, and Seigo Ando, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1979, Ser. No. 107,420
Claims priority, application Japan, Jan. 29, 1979, 54-8151
Int. Cl.³ G01B *7/14*; G01L *5/04*; G01R *33/12*
U.S. Cl. 73—159 **1 Claim**



1. A method for continuously measuring the steepness of a defective flatness of a metal strip during rolling, which comprises:

detecting a variation in the relative distance between a metal strip during rolling and a distance-detecting means arranged adjacent to the surface of said metal strip, during the travel thereof between two support rolls arranged at a prescribed spacing, by means of said distance-detecting means, as a vibration corresponding to a defective flatness produced in said metal strip;

detecting the amplitude and the frequency of the vibration produced in said metal strip from the detected value thus obtained of the vibration of said metal strip; and,

continuously calculating the ratio amplitude/(travelling speed/frequency) of said vibration, i.e., the steepness of the defective flatness of said metal strip, from the detected values thus obtained of the amplitude and the frequency of said vibration, and the detected value of the travelling speed of said metal strip determined separately;

said method being characterized by:

detecting the tension applied to said metal strip during the travel thereof between said two support rolls;

calculating, in accordance with the following formula, the frequency of the natural vibration of said metal strip during the travel thereof between said two support rolls, from the detected value thus obtained of the tension applied to said metal strip, the specific weight of said metal strip, and the distance between said two support rolls:

$$f_L = \frac{1}{2L}\sqrt{\frac{g \times 10^5}{\gamma} \cdot \sigma}$$

where,

f_L: frequency of said natural vibration of said hot-rolled steel strip during the travel thereof between said two support rolls,

L: distance between said two support rolls (cm),

γ: specific weight of said hot-rolled steel strip (g/cm^3),

g: gravitational acceleration (cm/sec^2), and

σ: average tension applied to said hot-rolled steel strip during the travel thereof between said two support rolls (kg/mm^2); and

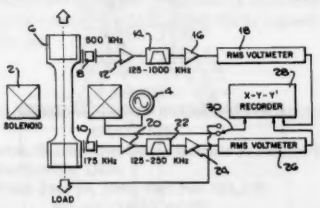
prior to said detection of the amplitude and the frequency of said vibration produced in said metal strip, cutting off the frequency component, which is below said calculated value of the frequency of the natural vibration of said metal strip, from said detected value of the vibration of said metal strip obtained by said distance-detecting means, thereby measuring the accurate steepness of the defective flatness of said metal strip.

4,309,903

METHOD AND APPARATUS FOR ANALYZING SELECTED MATERIAL PROPERTIES WITH MAGNETOMECHANICAL ACOUSTIC EMISSIONS

Kanji Ono, Granada HIlls, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 26, 1979, Ser. No. 107,313
Int. Cl.³ G01N *3/08, 29/00, 27/00*
U.S. Cl. 73—587 **27 Claims**



1. A method of analyzing a selected property of a ferromagnetic material, said property influencing the acoustic emission response of the material to an applied alternating magnetic field, comprising the steps of:

applying an alternating magnetic field to the material,

measuring the acoustic emission response of the material, using a plurality of individual transducers each responsive to a single frequency, at a selected response parameter,

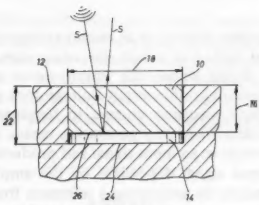
said selected response parameter being characterized by an acoustic emission response which, for each of said selected response parameter values, varies over a selected range of the analyzed property in mutual nonlinearity with variations in the acoustic emission response over the same range for each of the other selected response parameter values, and

comparing the measured acoustic emission responses to each other and to standard acoustic emission responses for said selected property and response parameter values.

4,309,904
APPARATUS IDENTIFICATION SYSTEM

William R. Jones, and Edgar F. Harrington, both of Houston, Tex., assignors to National Identification Bureau, Inc., Houston, Tex.

Filed Apr. 1, 1980, Ser. No. 136,388
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—597 **4 Claims**



1. A method of identifying an article, comprising the steps of:

(a) passing a traveling wave through each of a plurality of pellets secured to an article such that they may be identified by a time measurement of a traveling wave having known characteristics passing through each of the pellets, said pellets having a known material and thickness interrelationship; and

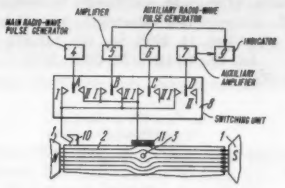
(b) measuring the time of travel of the respective traveling wave through the respective pellet and converting that measurement to a unique identifier for each pellet.

4,309,905
METHOD FOR DETECTING NON-UNIFORMITIES OF MAGNETIC MATERIALS AND DEVICE FOR EFFECTING SAME

Mikhail I. Maizenberg, ulitsa K. Marxa, 15/1, kv. 117; Mikhail D. Kaplan, ulitsa Iskry, 3, kv. 3; Stanislav V. Veremeenko, ulitsa Dimo, 17/1, kv. 35; Vladimir T. Bobrov, ulitsa Belskogo, 34/1, kv. 117; Vladimir U. Moshkovich, ulitsa Vossoedinenia, 5, kv. 67; Petr F. Shapovalov, bulvar K. Marxa, 10, kv. 13, all of, Kishinev; Vladimiru A. Troitsky, ulitsa Bratislavskaya, 8, kv. 86, Kiev; Petr G. Zhukovsky, ulitsa Belorusskaya, 15, kv. 67, Kiev, and Igor B. Komsky, ulitsa Krasnoarmeiskaya, 67, kv. 20, Kiev, all of U.S.S.R.

Filed Dec. 26, 1979, Ser. No. 106,517
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—601 **36 Claims**

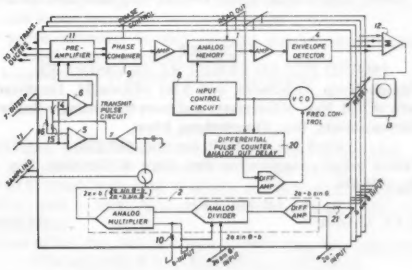
1. A method for detecting non-uniformities of magnetic materials, comprising the steps of placing a material to be tested in a magnetic field, acting on the surface of a magnetostrictive medium arranged in proximity to a non-uniformity zone of said material by ultrasonic vibration whereof the polarization vector contains a component normal to the surface of said material, and recording signals resulting from the electro-magnetic-acoustic conversion in said magnetostrictive medium.



4,309,906
APPARATUS FOR PROVIDING AN ULTRASONIC SECTIONAL VIEW

Allan Northeved, Bagsvaerd, and Knud C. C. Fabrin, Farum, both of Denmark, assignors to Medicoteknisk Institut, Svejsecentralen, Glostrup, Denmark

Continuation of Ser. No. 913,174, Jun. 6, 1978, abandoned. This application Mar. 3, 1980, Ser. No. 126,917
Claims priority, application Denmark, Jun. 15, 1977, 2642/77; Feb. 15, 1978, 681/78
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—612 **6 Claims**



1. An ultrasonic apparatus for producing a sectional view of an object on a screen, said apparatus comprising:

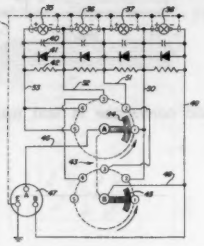
(A) a plurality of like sets of at least two ultrasonic transducer elements each; and

(B) a plurality of control units, each control unit being coupled to a respective one of said sets and including an analog calculating circuit arranged to excite the ultrasonic elements of the set in timed sequence to transmit ultrasonic energy focused at a respective common focal point in a region to be scanned, the common focal point of transmitted energy from each set being at a different position in said region, each said control unit further including means for combining echo signals produced by its associated set of transducer elements upon reception of reflected ultrasonic energy from an object in said region and an analog memory for delaying the combined signal so that it may be visually reproduced on said screen in a correct geometrical position relative to the combined signals respectively produced by the other sets of transducer elements, said echo signal combining means and analog memory being connected in controlled relation to said analog calculating circuit.

4,309,907
LOAD MONITOR WITH SELECTIVE SENSOR CONNECTION

Tadas Budraitis, Midlothian, and Gerald W. Seliga, Frankfort, both of Ill., assignors to Productronix, Inc., Oak Forest, Ill.

Filed Feb. 14, 1980, Ser. No. 121,811
Int. Cl.³ G01B 7/18; G01L 5/16
U.S. Cl. 73—771 **6 Claims**

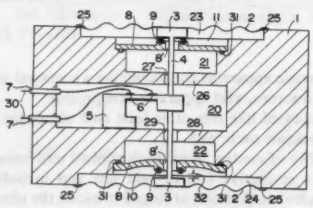


1. A load monitor for a reciprocating machine having a plurality of support members, comprising:
- a plurality of sensors, one mounted on each of different support members;
- a circuit connecting said sensors in series;
- an electrical connector on said machine for connection with a portable load indicator; and
- a multi-position switch at said machine connected between said sensor circuit and said electrical connector, said switch having positions to connect each sensor individually with said connector, and a position to connect the series combination of said sensors with said connector.

4,309,908
LIQUID FILLED PRESSURE TRANSDUCER

Christoph Rapp, Griesheim, and Karl Mikulecki, Darmstadt, both of Fed. Rep. of Germany, assignors to Hottinger Baldwin Measurements, Inc., Framingham, Mass.

Filed Jul. 10, 1980, Ser. No. 167,238
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935476
Int. Cl.³ G01L 9/04
U.S. Cl. 73—720 **9 Claims**

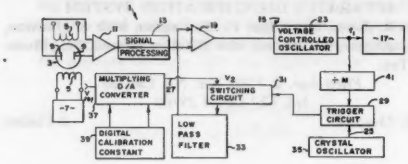


1. A pressure transducer, comprising housing means, cavity means in said housing means filled with a liquid, sensor means operatively supported in said cavity means, opening means in said housing means, membrane means operatively secured to said housing means to close the opening means, force transmitting means operatively connecting said membrane means to said sensor means, output means (7) operatively connected to said sensor means, deformable stop means in said housing means and interposed between said sensor means and said membrane means, said deformable stop means having an aperture, said force transmitting means extending freely through said aperture of said deformable stop means, and elastic sealing means operatively interposed between said membrane means and said deformable stop means, whereby flow of liquid from a space between said membrane means and said stop means through said aperture may be prevented when said membrane means contact said elastic sealing means.

4,309,909
CRYSTAL STABILIZED VOLTAGE TO FREQUENCY CONVERTER WITH DIGITAL CALIBRATION FOR FLOWMETERS

John C. Grebe, Jr., Norristown, and William R. Freund, Jr., Hatfield, both of Pa., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 9, 1979, Ser. No. 82,765
Int. Cl.³ G01F 1/60
U.S. Cl. 73—861.12 **10 Claims**



1. In a flowmeter producing an output voltage dependent on flow rate, and including means for converting said output voltage to a digital signal, the improvement wherein said means for converting said output voltage to a digital signal comprises a high precision voltage to frequency converter system comprising frequency generating means for receiving said output voltage as an input signal and producing a variable frequency output signal dependent on the amplitude of the input signal, means for generating a reference frequency, trigger means responsive to said output signal and to said reference frequency for producing a feedback signal having a duty cycle proportional of the ratio of said input frequency and said reference frequency, and switching means for producing an output signal having an amplitude dependent on said reference voltage and a duty cycle equal to the duty cycle of said second signal, and filter means for deriving said output voltage from said output signal.

6. In a flowmeter producing a frequency output dependent on flow rate, the improvement comprising a precision frequency to voltage converter system for receiving said frequency output as an input frequency and producing an output voltage proportional to said input frequency, said system comprising means for generating a reference frequency, means for generating a reference voltage, trigger means responsive to said input frequency and to said reference frequency for producing a second signal having a duty cycle dependent on the relationship between the frequencies of said output signal and said reference frequency, reference voltage means for controlling the amplitude of said feedback signal, and comparator means for receiving said feedbadk signal and said input signal and applying to said frequency generating means a signal dependent on the relationship between said input signal and the average value of said feedback signal.

4,309,910
STRING TENSION TESTER

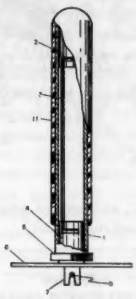
Frank A. Walker, Jr., 20292 Bancroft Cir., Huntington Beach, Calif. 92646

Filed Dec. 31, 1979, Ser. No. 108,352
Int. Cl.³ G01L 5/06
U.S. Cl. 73—862.46 **11 Claims**

1. A sports racquet string tension tester comprising:
- an elongated hollow handle, having a front and a rear end, said handle having a circular opening at the front end thereof;
- a torsion spring mounted within said handle and having one end secured to the rear of said handle;

a cylindrical block rotatably mounted in said circular opening at the front end of said handle, said torsion spring being secured at its other end to said cylindrical block;

V-shaped means secured to the outer end of said cylindrical block, for firmly engaging strings of different thicknesses without lost motion; and



means secured to said front end of said handle and to said block for indicating the tension of the strings in said sports racquet when said V-shaped string engaging means is engaged with the strings, and the handle is rotated;

whereby the firm engagement of strings of any thickness prevents lost motion and resultant errors as the handle is rotated.

4,309,911

METHOD FOR TESTING THE MINIMUM PULLOUT STRENGTH OF A GROUND ANCHOR (D#73,790-C1-D2)

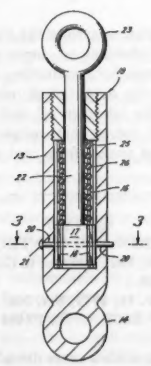
Richard H. McCall, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 947,917, Oct. 2, 1978, Pat. No. 4,217,776, which is a continuation of Ser. No. 905,262, May 12, 1978, abandoned. This application Feb. 19, 1980, Ser. No. 122,552

The portion of the term of this patent subsequent to Aug. 19, 1997, has been disclaimed.

Int. Cl.³ G01L *1/00*

U.S. Cl. 73—862.53 **11 Claims**



1. A method for testing the minimum pullout strength of a ground anchor for an oil well derrick guy wire, or the like, comprising the steps of,

(a) positioning an elongated means deep in an open ended housing means,

(b) protruding a shear pin of a predetermined strength transversely through the housing means and the elongated means,

(c) connecting the housing means to the anchor,

(d) connecting the elongated means to a winch, and

(e) reeling in the winch until the shear pin breaks so that while applying an increasing load on the elongated means, if the anchor does not move prior to breaking of the shear pin, a safe, satisfactory, and reliable anchor is indicated.

4,309,912

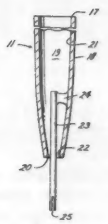
MICRO-ANALYSIS PROCESS AND DEVICE

Kendall O. Smith, 133 Trillium, San Antonio, Tex. 78213

Filed Aug. 1, 1980, Ser. No. 174,532

Int. Cl.³ B01L *3/02*; G01N *1/12*

U.S. Cl. 73—864.72 **11 Claims**



1. In combination with liquid handling means comprising a liquid reservoir, metering means to accurately and reproducibly control the dispensing of said liquid, and connector means adapted to receive a tip,

said tip comprising an outer wall, an inner wall, upper bore and lower bore,

a probe mounted in said tip and passing downwardly through said lower bore, and

a longitudinally extending slot in said probe.

4,309,913

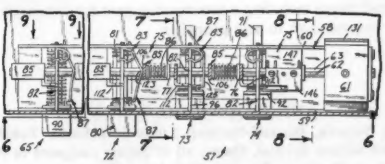
SERIAL RELEASE MECHANISM AND DRAINAGE MONITOR EMBODYING THE SAME

George F. Schwoboda, New Brighton, and Robert C. Wingrove, Afton, both of Minn., assignors to Medical Devices, Inc., St. Paul, Minn.

Division of Ser. No. 847,701, Nov. 2, 1977, Pat. No. 4,181,121. This application Oct. 2, 1979, Ser. No. 81,179

Int. Cl.³ G05G *17/00*

U.S. Cl. 74—3.52 **9 Claims**



1. In a serial release mechanism, in combination:

series of actuators normally urged resiliently into first, working positions;

trigger means releasably holding said actuators in second, withdrawn positions;

trigger release means effective in a first state, when operated, to release said trigger means;

means for operating said trigger release means;

disabling means normally effective to actuate said trigger release means into a second state in which release of said trigger means thereby is prevented; and

override means effective, when any actuator in a series is in working position, to override the release disablement of only the next actuator in the series,

so that successive operations of the operating means cause successive release of single actuators in said series.

4,309,914

CONTROLLED TRANSMISSION SYSTEM

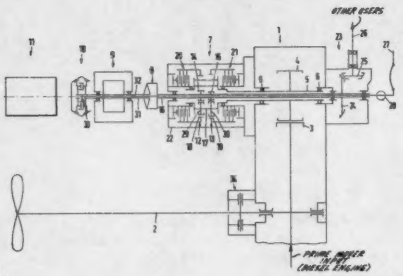
Heinz M. Hiersig, Düsseldorf, and Herbert Wedler, Witten, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,405

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 2758555

Int. Cl.³ F16H *37/06, 57/10;* B63H *23/18*

U.S. Cl. 74—15.4 **8 Claims**



1. In a ship's drive system, having a main engine and a propeller driven by the engine, a controlled transmission, comprising:

a stationary case;

an electric generator;

a first shaft connected to the generator; a second shaft, said first shaft and said second shaft leading into the case;

a first and second planetary gear set of different transmission ratios, each having a sun gear, planet carrier means, planet gears, and internal ring gears, the two sun gears being mounted to the first shaft, the two planet carrier means being mounted to the second shaft;

first and second clutch means disposed and configured for respectively connecting the internal ring gears to said case, at least one of the first and second clutch means being always deenergized, permitting idling of the respective one of the ring gears; and

gear means including a transmission gear for connecting said second shaft to said propeller.

4,309,915

AUTOMOTIVE TRANSMISSION

Koji Nozawa, Higashi-kurume; Yukio Mizukoshi, Yokohama, and Mitsuo Ikkatai, Oume, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

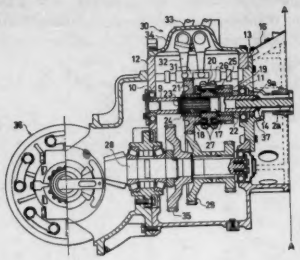
Filed Jun. 7, 1979, Ser. No. 46,369

Claims priority, application Japan, Jun. 13, 1978, 53-71637

Int. Cl.³ F16H *3/38, 57/02;* F16D *23/06*

U.S. Cl. 74—339 **10 Claims**

1. A transmission gear for an automotive vehicle comprising: a transmission input shaft; a main shaft carrying first and second gears and a synchronizer disposed between said gears, said main shaft being axially slidable along and synchronously rotatable with said input shaft; first means connectable with both of said main shaft and input shaft for releasably interlocking the main and input shafts together, said first means including a lock pin passing through said main and input shafts; and second means disposed on said main shaft for maintaining said



first gear, synchronizer, and second gear in a predetermined operative position on said main shaft.

4,309,916

BEARING APPARATUS FOR GEAR TYPE POWER TRANSMISSION SYSTEM

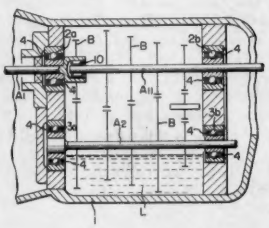
Takeo Ohkuma, Fujisawa; Kyozaburo Furumura, Chigasaki; Akihiko Tanaka, Fujisawa, and Shinichi Shirota, Yokohama, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 882,858, Mar. 2, 1978, abandoned. This application Jan. 14, 1980, Ser. No. 112,111

Claims priority, application Japan, Mar. 3, 1977, 52-22252

Int. Cl.³ F16H *57/04*

U.S. Cl. 74—467 **15 Claims**



1. A power transmission system for vehicles comprising a casing containing a lubricant oil, input shaft means, output shaft means, gear means for transmitting the power from the input shaft means to the output shaft means, the gear means being lubricated by the lubricant oil, and bearing means supporting the input and output shaft means, the bearing means containing a lubricant sealed from and independent of said lubricant oil.

4,309,917

TRANSMISSION AND CONTROL SYSTEM

Warren E. Leet, Lizton, Ind., assignor to General Motors Corporation, Detroit, Mich.

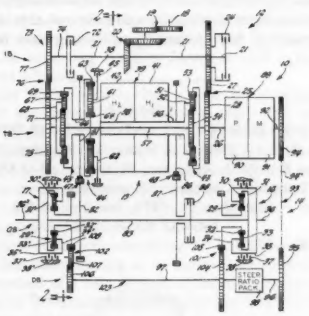
Filed Dec. 11, 1979, Ser. No. 102,625

Int. Cl.³ B60K *41/06;* F16H *47/04*

U.S. Cl. 74—861 **6 Claims**

1. A control for use with a cross drive transmission having an input, two outputs, and output drive means for driving said two outputs; hydro-mechanical transmission means connecting said input to drive said output drive means and including hydrostatic propulsion transmission means having hydrostatic units with propulsion displacement change means and connecting propulsion kidney passages for variable speed ratio hydrostatic propulsion drive, and ratio-establishing means selectively

operable for establishing a low gear ratio and a high gear ratio coordinated with said variable speed ratio hydrostatic propulsion drive for providing continuously variable overall speed ratio propulsion drive from said input to said output drive means and said two outputs; and hydrostatic steer drive means having hydrostatic units with steer displacement change means and connecting steer kidney passages for variable speed ratio steer drive proportional to steer request; said control comprising source means for providing fluid pressure; torque demand means for providing a torque demand signal proportional to torque demand; steer control means connected to said steer displacement change means including hydromechanical link means operative when supplied with fluid pressure for providing a steer request signal to, and for controlling said steer displacement change means for said variable speed ratio steer drive for variable steer proportional to steer request; ratio governor means operatively connected with said input, said torque demand means, said steer control means, and said source means and having set speed control means for providing a set speed increasing to the higher value of set speed values increasing with both torque demand and steer request, and including signal means for providing an advance signal when input speed exceeds said set speed and a return signal



when input speed is less than said set speed; displacement control means operatively connected with said ratio governor means for controlling the displacement of said propulsion displacement change means in response to said advance and return signals to respectively increase and decrease said speed ratio of said hydrostatic propulsion drive; shift signal means operatively connected to said source means, said ratio governor means, and said propulsion displacement change means for distributing shift signals at a predetermined displacement of said propulsion displacement change means; shift valve means operatively connected to said shift signal means and to said ratio-establishing means for providing selective interchanging establishment of said ratio-establishing means in response to said shift signals and for controlling said displacement control means to provide coordinated speed ratio change of said hydrostatic propulsion drive for overall continuous ratio change of said propulsion drive; steer disabling means operatively connected to said steer control means and to the one of said steer kidney passages having the lower steer kidney pressure to normally supply fluid pressure to said hydromechanical link means of said steer control means and to discontinue supply of fluid pressure to said hydromechanical link means in response to a predetermined abnormally low value of of said lower steer kidney pressure to discontinue steering.

4,309,918

RETARDING MEANS FOR MOTOR VEHICLES

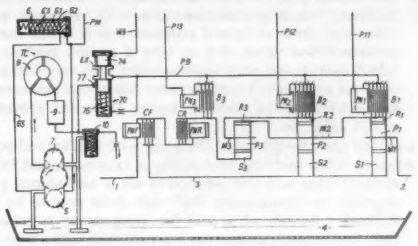
Albert A. Miller, Clovenfords, Scotland, and Andrew G. Wilson, Hartley Wintney, England, assignors to AB Volvo, Goteborg, Sweden

Filed Oct. 30, 1979, Ser. No. 89,700

Claims priority, application United Kingdom, Oct. 30, 1978, 42398/78

Int. Cl.³ B60K *41/06*; F16H *57/00*

U.S. Cl. 74—867 **11 Claims**



1. In a vehicle drive transmission including a multiple-plate friction brake, retardation control means for controlling the operation of said brake, said control means having a control member operable by an operator of the transmission to retard the transmission by variably engaging the multiple-plate friction brake, and means for supplying cooling fluid to the friction surfaces of the brake plates, the improvement comprising said control means including first means responsive to a first movement of the control member to vary the supply of the cooling fluid to the friction surfaces of the brake plates to produce a correspondingly varying fluid drag in the brake, and said control means including further means responsive to progressively further movement of the control member to engage the brake plates to produce a corresponding frictional drag therebetween.

4,309,919

UPSHIFT SCHEDULING VALVE FOR USE IN HYDRAULIC TRANSMISSION CONTROL SYSTEM

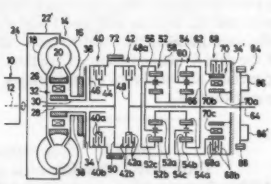
Kazuyoshi Iwanaga, Yokohama; Kazuhiko Sugano, Tokyo, and Kunio Ohtsuka, Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Apr. 24, 1979, Ser. No. 32,800

Claims priority, application Japan, Aug. 24, 1978, 53-102993

Int. Cl.³ B60K *41/06, 41/10*

U.S. Cl. 74—869 **2 Claims**



1. A hydraulic control system for a transmission mechanism, comprising:

a first passageway which is pressurized when a higher gear ratio is selected and which is exhausted when a lower gear ratio is selected;

an upshift scheduling valve including

a valve chamber;

a valve element slideably disposed within said valve cham-

ber and defining within said valve chamber a compartment;

said valve chamber having a first port communicating with the first passageway and with said compartment, having a second port communicable with said compartment, and having a drain port communicable with said compartment;

said valve element having an area exposed to said compartment;

said valve element being slideable in response to pressure within said compartment to take a first position in which said second port is out of communication with said compartment, but is in communication with said drain port when said pressure in said compartment is lower than a predetermined value, and to take a second position in which said second port communicates with said first port only via said second compartment when said pressure in said second compartment is higher than said predetermined value; and

a second passageway communicating with said second port;

whereby when said first passageway is exhausted, said valve element takes said first position to allow said second passageway to communicate with said drain port to be exhausted, whereas, when said first passageway is pressurized, said second passageway is pressurized with a time lag during which said valve element moves from said first position to said second position.

4,309,920

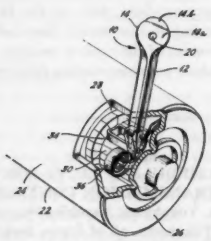
COMMUTATOR BRUSH TOOL

Leonard R. Rickert, 1075 Bristol Rd., Warminster, Pa. 18974, and Russell L. Rickert, 925 Maple Ave., Ardsley, Pa. 19038

Filed Feb. 8, 1980, Ser. No. 119,907

Int. Cl.³ B25B *27/00*

U.S. Cl. 81—3 R **4 Claims**



1. A tool comprising an elongated C-shaped channel portion including a flat bottom wall and a pair of parallel side walls extending perpendicularly upwardly therefrom, and a gripping portion formed at one end of said C-shaped channel portion, this gripping portion being a flat gripping surface formed by a flat extension of said flat bottom wall and a lateral projection of said side walls, said parallel side walls being relieved at said other end of the said C-shaped channel portion, wherein said flat gripping surface also includes an upstanding wall extending from the end thereof.

4,309,921

CAN TOP OPENER

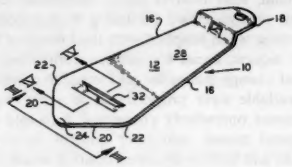
Raphael W. Miller, Jackson, Mich., assignor to Liftab Corporation, Jackson, Mich.

Filed May 7, 1980, Ser. No. 147,398

Int. Cl.³ B67B *7/00*

U.S. Cl. 81—3.46 R **6 Claims**

1. An opener for cans having a lid including a scored closure adapted to be displaced inwardly by a levered tab affixed adjacent the closure by a fastening element attached to the lid, the tab including a handle portion adapted to be raised away from the can lid defined on one side of the fastening element and a closure depressing portion defined on the other side of the fastening element, the opener comprising a generally elongated planar body having upper and lower sides, a nose end, and a handle portion, a tab handle portion engaging element defined on said body intermediate said nose end and body handle portion extending below said body lower side defining an opening adapted to receive a tab handle portion, said tab handle portion engaging element comprising an elongated bridge lanced from said body having a length transverse to the



body length, said bridge including a base spaced from said body having ends connected to said body by support elements, said bridge being spaced from said nose end in the direction of the length of said body at a position which superimposes said nose end over a portion of the closure upon the body being inserted over the tab with the tab handle portion received within said opening and said bridge substantially engaging the tab fastening element whereby said nose end aids in the inward displacement of the closure upon raising said body handle portion.

4,309,922

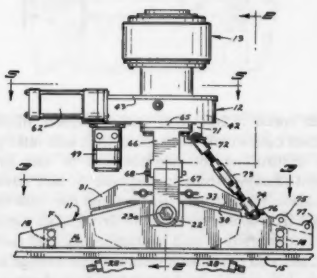
ROD BREAK-OUT AND MAKE-UP TOOL

Gary H. Beckley, Roseville; Walter W. Svendsen, New Brighton, and Ronald B. Anderson, Plymouth, all of Minn., assignors to Longyear Company, Minneapolis, Minn.

Filed Jun. 14, 1979, Ser. No. 48,489

Int. Cl.³ B25B *17/00*

U.S. Cl. 81—57.16 **20 Claims**

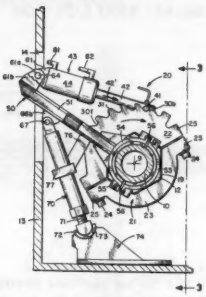


1. Apparatus for making up and breaking out a joint of a first drill rod and a second drill rod comprising a jaw holder having a pair of oppositely disposed trunnions, a base for engaging a supporting surface and pivotally mounting the trunnions to support the jaw holder, jaws mounted by the holder for movement between a position to clampingly engage the first drill rod to hold the first drill rod in a stationary position, and a release position, jaw actuator means mounted by the jaw holder for moving the jaws between their clamping and release positions, means for clampingly engaging the second drill rod and drivingly rotating the second drill rod, and means mounted on the jaw holder for supportingly mounting the second drill rod engaging means in substantial spaced relationship to the jaw holder.

4,309,923
POWER TOOL FOR TORQUING ENCLOSED CONNECTORS

Claude H. Wilmeth, Montgomery, Tex., assignor to N-S-W Corporation, Austin, Tex.

Filed Jun. 23, 1980, Ser. No. 162,460
Int. Cl.³ B25B *13/50*
U.S. Cl. 81—57.34 3 Claims



1. In a high-torque tool comprising a socket wrench for turning a threaded connector, a fluid-operated cylinder for driving said wrench to thereby rotate said threaded connector, and a reaction structure for supporting said cylinder and for providing the necessary reaction forces to said cylinder, the improvement wherein:

said socket wrench comprises a pair of semi-cylindrical wrench segments boltable to each other and defining a socket at the center thereof, said socket having a shape adapted to receive therein said threaded connector, at least one of said segments having a radially and outwardly extending head defining a plurality of angularly-spaced notches generally arranged in a circular pattern relative to the longitudinal axis of said wrench;

said reaction structure comprising:

a reaction beam having at its inner end an anchor clamp comprised of a pair of semi-cylindrical clamp members adapted to detachably clamp said beam to a first anchor adjacently positioned to said threaded connector, and an adjustable reaction leg having one end pivotably connected to said beam and an opposite end which serves, in use, as a reaction foot adapted to abut against a second anchor adjacent to said connector; and

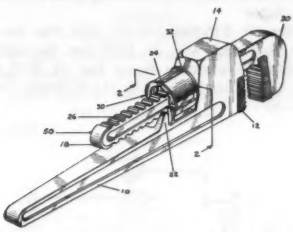
said cylinder being pivotably connected to the opposite end of said reaction beam, and having a rod which consecutively engages said notches to thereby consecutively rotate said wrench.

4,309,924
NUT AND RETAINER FOR QUICK ADJUSTABLE JAW WRENCH

Donald E. McLain, Portage, Mich., assignor to Kalamazoo Incorporated Technology, Kalamazoo, Mich.

Filed Jul. 13, 1979, Ser. No. 57,389
Int. Cl.³ B25B *13/16*
U.S. Cl. 81—159 9 Claims

1. In a jaw-type wrench having an elongated handle provided with an enlarged housing adjacent one end thereof, said housing having a noncircular opening extending therethrough, a fixed jaw secured to said housing, a movable jaw element having thereon a movable jaw positioned substantially opposite said fixed jaw, said movable jaw element having an elongated shank which slidably extends through the opening in said housing, said shank being of noncircular cross section and having segmental threads formed along at least one side thereof, said handle also having an open region defined between a pair of opposed stop surfaces which are spaced apart in the longitudinal direction of the handle, the improvement comprising a one-piece U-shaped retainer clip loosely and movably positioned within said region between said opposed pair of stop surfaces, said clip including a bight positioned adjacent the bottom wall of said region as defined on said handle, said retainer clip having a pair of opposed spring arms defining therein aligned noncircular openings which slidably and nonrotatably pass therethrough said shank, and an annular adjusting nut positioned around said shank and having internal threads operatively engaged with the segmental threads on said shank, said internal threads having a segmental gap formed therein adapted to clear the segmental threads on said

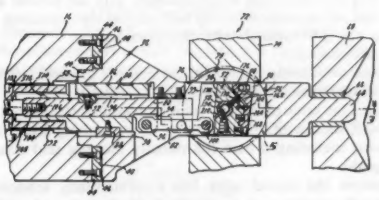


shank in one rotated position of the nut relative to the shank, said nut being positioned between the arms of said retainer clip and having an axial length such that the opposed spring arms bear yieldably and frictionally against the opposite axial end surfaces of the nut to retain the latter therebetween even when the clip and nut are separated from the wrench, said nut being captivated and retained solely due to its surrounding said shank and being resiliently axially confined between said opposed spring arms, and said retainer clip being captivated and retained solely due to the shank passing through the openings in the spring arms and the loose retention of the clip between the opposed pair of stop surfaces.

4,309,925
TOOL COMPENSATION MECHANISM

Frank R. Mottershead, Birmingham; John J. Konkal, Bloomfield Hills, and Charles G. Gerlach, Mt. Clemens, all of Mich., assignors to The Cross Company, Fraser, Mich.

Filed Nov. 13, 1979, Ser. No. 93,836
Int. Cl.³ B23B *5/40*
U.S. Cl. 82—12 20 Claims



1. In a machine tool,

a rotatably driven member;

a holder carried by and rotatable with said member and oscillatively actuatable about an axis substantially perpendicular to the rotational axis of said member;

a cutting element carried by said holder; resilient means associated with said holder permitting movement of said cutting element radially relative to the oscillatory axis of said holder normally yieldably urging said cutting element in the direction of said oscillatory axis;

first actuator means mounted for rotation with said driven member and for reciprocatory movement relative thereto

operatively connected to said holder to rock the latter about said oscillatory axis; and

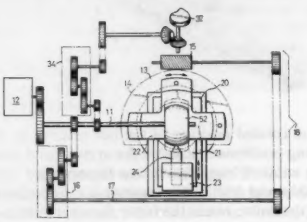
second actuator means also mounted for rotation with said driven member and for reciprocatory movement relative thereto independently of said first actuator means coactive with said resilient means for adjusting said cutting element radially away from the oscillatory axis of said holder against the action of said resilient means.

4,309,926

METHOD AND APPARATUS FOR PREPARATION OF SPHERICAL HOB FOR GENERATION OF GEAR

Masato Ainoura, 1253 Eguchi, Kita-Shigeyasu-cho, Miyaki-gun, Saga-ken, Japan

Division of Ser. No. 916,690, Jun. 19, 1978, Pat. No. 4,202,222.
This application May 29, 1979, Ser. No. 42,840
Claims priority, application Japan, Jun. 20, 1977, 52/73124
Int. Cl.[3] B23B *5/42*; B23F *21/16*; B23B *5/46*
U.S. Cl. 82—19 5 Claims



1. An apparatus for preparation of a spherical hob for generation of an involute gear comprising,

a supporting shaft to which a spherical hob blank is coaxially attachable,

means for rotating said shaft,

means pivotally supporting a swivel table on an axis which intersects a center of the hob blank when the hob blank is attached to said shaft,

a substrate plate,

means mounting the substrate plate for movement on the swivel table to and fro radially of the swivel table,

a cutting tool attaching stand,

means for attaining said cutting tool attaching stand to said substrate plate for movement together with said substrate plate,

means pivotally mounting said means for attaching the cutting tool attaching stand coaxially with the pivotal axis of said swivel table whereby said cutting tool attaching stand is also pivotable about said common axis,

a cutting tool,

means detachably fixing said cutting tool to said cutting tool attaching stand for cutting the hob blank,

means for controlling the rotation speed of the swivel table and, therewith, of the cutting tool attaching stand, and

means including a cam for radially moving said substrate plate,

wherein the swivel table has a substantially semicircular configuration and is disposed so that the pivotal axis thereof is located below the center of the hob blank,

said swivel table includes a concavity with said substrate plate being disposed in said concavity,

said means for attaching said cutting tool attaching stand to said substrate plate comprises a cutting tool fixing plate mounted on the substrate plate and interposed between said substrate plate and said cutting tool attaching stand,

said cutting tool fixing plate has a pin receiving hole formed therethrough and a guide pin,

said substrate plate has a guide groove formed thereon, said guide pin being received in and guided by said guide groove, and

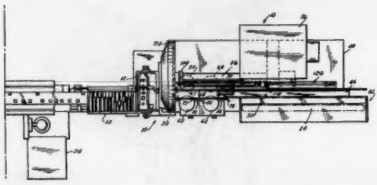
said means pivotally mounting said means for attaching the cutting tool attaching stand comprises a pin passing through said pin receiving hole.

4,309,927

CONTINUOUS COLD CUT SLICING MACHINE

Edmund G. Dennis, Port Jefferson, N.Y., and Oscar W. Dillon, Essex, Conn., assignors to Cashin Systems Corporation, Hauppauge, N.Y.

Filed Dec. 5, 1979, Ser. No. 100,547
Int. Cl.[3] B26D *5/20*, *7/30*
U.S. Cl. 83—77 25 Claims



1. A combination of a slicing machine having a slicing blade for slicing a loaf of product having a front and rear end; a first feed means for feeding said loaf into said blade; a control means for determining the rate of feed of the product by the first feed means towards the blade and consequently controlling slice thickness; a second feed means for feeding a loaf towards the blade when said loaf becomes disengaged from said first feed means during slicing operation which includes a gripper means for engaging the rear end of the loaf; a clutch means connected to said control means; a drive means connected to said second feed means and said clutch means so as to allow the driving of the second feed means by the clutch means in conjunction with the control means towards the blade during slicing of the loaf, and away from the blade upon completion of the slicing; and said clutch means also capable of providing drag on the second feed means during slicing of the loaf beyond the first feed means adjacent the blade to compensate for the pull of the blade.

4,309,928

APPARATUS FOR SIMULTANEOUSLY CUTTING WIRE SEGMENTS FROM A PLURALITY OF WIRES

Jan C. Mitrzyk, Sr., Unadilla; Rodney W. Gossoo, Sidney Center; Charles P. Fischer, Sidney; Howard N. Silvernail, Otego, and Charles Null, Oneonta, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed May 27, 1980, Ser. No. 153,305
Int. Cl.[3] B21F *11/00*
U.S. Cl. 83—161 13 Claims

1. An apparatus for simultaneously producing a plurality of wire segments having acute angled ends from a plurality of wires, comprising:

(a) means for guiding said plurality of wires in a parallel relationship;

(b) means for cutting said wires, adjacent said guide means, to simultaneously cut a segment from each of said plurality of wires, said cutting means having:

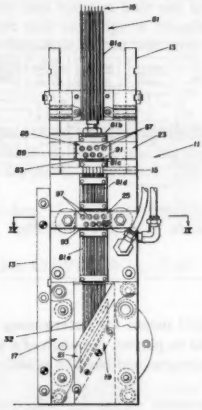
(1) means for clamping said wires to be cut comprising a pressure pad and a confronting base member, both the pressure pad and base member having a plurality of grooves therein axially aligned with the guide means for said plurality of wires, said pressure pad having a first sliding surface and said base member having a second sliding surface coplanar with said first sliding surface,

(2) means for shearing wire segments from said plurality of wires comprising a shear plate having grooves therein, axially aligned with the grooves of said pressure pad, and having a third sliding surface slidable

along said first and second sliding surfaces of the pressure pad and confronting base member, all three of said sliding surfaces being at a common acute angle to the axes of said grooves, and

(3) means for reciprocating said shear plate to shear portions of said plurality of wires and simultaneously form a plurality of wire segments;

(c) means for intermittently feeding portions of said plurality of wires through the clamp means and past the sliding surfaces of the cutting means;



(d) a segment supporting base, positioned adjacent said base member of the cutting means, having a smooth surface spaced from the grooves of said base member; and

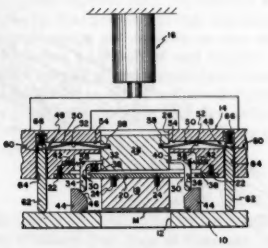
(e) a cover plate superimposed over the segment supporting base, the terminus of said cover plate being spaced from said base member of the cutting means, said cover plate having grooves therein coaxial with the grooves of said base member.

4,309,929

TRIM PRESS HAVING HAMMER DRIVE FOR PUNCH

Edward E. Batson, Mesa, Ariz., assignor to Leesona Corporation, Beaverton, Mich.

Filed Feb. 20, 1980, Ser. No. 122,855
Int. Cl.³ B26D *5/08*
U.S. Cl. 83—554 **8 Claims**



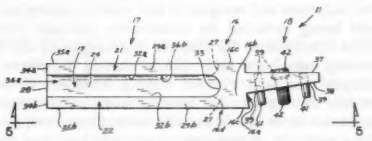
1. In a trim press having a die with an opening therein, a platen mounted for reciprocatory movement relative to said die, and a punch carried by said platen and movable into and out of said opening in said die upon reciprocation of said platen to shear or sever material overlying said die and the edge of said opening; the improvement comprising means mounting said punch on said platen for limited movement relative to said platen, a hammer mounted on said platen for movement relative to said platen and said punch, releasable latch means engageable with said hammer and operable when engaged with said hammer to releasably latch said hammer against movement relative to said platen, first spring means mounted on said platen and connected with said hammer operable upon movement of said platen to exert a biasing force on said hammer which is steadily increased in response to movement of said platen; and means for releasing said latch means to permit said first spring means to drive said hammer relative to said platen to strike a hammer blow to said punch when said punch is at a predetermined position relative to said die.

4,309,930

BLADE GUIDE

Stephen C. Wright, Bettendorf, Iowa, assignor to Hansaloy Corporation, Davenport, Iowa

Filed May 5, 1980, Ser. No. 146,978
Int. Cl.³ B26D *1/54*
U.S. Cl. 83—820 **8 Claims**



1. A blade guide for use in bread slicing machines employing band blades, said guide comprising:

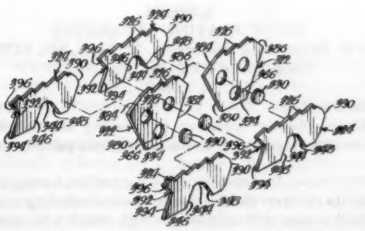
body means for attachment to a slicing machine; and means for guiding band blades, including first and second guide structures extending from said body means and forming a guide channel therebetween, said first guide structure including at least one first guide prong, said second guide structure including at least two second guide prongs, said first and second guide prongs having wear surfaces which face each other across said guide channel, said second guide prongs being spaced apart to form a slot communicating with said guide channel, said first guide prong being disposed such that said slot is across said guide channel from said first guide prong's wear surface, the band blade being received in said guide channel.

4,309,931

ARTICULATED SAW

Carl J. Alexander, Box 18, Moore Park, Mich. 49093

Continuation-in-part of Ser. No. 944,202, Sep. 19, 1978, abandoned, which is a continuation of Ser. No. 697,978, Jun. 21, 1976, abandoned. This application Jul. 23, 1979, Ser. No. 59,985
Int. Cl.³ B27B *17/02*
U.S. Cl. 83—832 **11 Claims**



1. A saw blade comprising;

an endless array of substantially planar cutting members

which are hingedly interconnected and together form a substantially planar, articulated band; each substantially planar cutting member in said endless array having a pair of opposed longitudinal margins, a pair of end margins, a plurality of cutting teeth disposed along one longitudinal margin thereof to define a cutting face thereon, and a bearing face disposed along the other of said longitudinal margins; said planar cutting members being situated in said array so as to present a circumferential row of cutting teeth about the periphery of said articulated band, said array having a plurality of exterior cutting members and a plurality of middle cutting members; said array further having journalled connector means comprising a journal and a journal bearing associated therewith for rotatably connecting adjacent cutting members; said exterior cutting members being aligned in end-to-end relationship in two substantially parallel exterior rows; said middle cutting members being disposed therebetween and aligned in a middle row in spaced end-to-end relationship; said cutting faces of said exterior cutting members being substantially aligned with said cutting faces of said middle cutting members; each said exterior cutting member overlapping two adjacent end margins of said middle cutting members and being mounted on consecutive journals extending from either side of the adjacent end margins of said middle cutting members; said middle cutting members being deeper than said exterior cutting members to provide middle cutting member bearing faces which project beyond the depth of said exterior cutting members; each said deeper middle cutting member adapted for being disposed in a peripheral slot of a saw blade support with said middle cutting member bearing face slidably abutting the bottom of the slot; and said exterior cutting members being disposed alongside said middle cutting members with said exterior cutting member bearing faces adapted for slidably abutting peripheral portions of the blade support on each side of said slot; each pair of adjacent exterior cutting members adapted to be rotated about their respective journals to orient their respective cutting faces into and out of a substantially common plane; one of the two end margins of each exterior cutting member extending outwardly to define a convex abutment portion and the other of said two end margins of each said exterior cutting member defining an engaging means extending inwardly to define a concave receiving portion, the convex portion of one exterior cutting member extending into and being received in the concave receiving portion of an adjacent exterior cutting member for accommodating the rotation of two adjacent, end-to-end aligned exterior cutting members on their respective journals on one of said middle cutting members in a direction toward said bearing face of said middle cutting member and for preventing rotation of the two exterior cutting members about their respective journals on the middle cutting member in a direction away from said middle cutting member bearing surface beyond the orientation where the cutting faces of said exterior cutting members lie in the substantially common plane.

4,309,932

MUSIC PLAYING APPARATUS

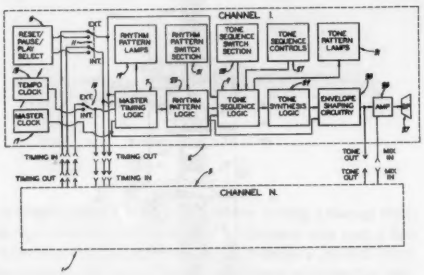
James M. Baker, 1818 Hickory St., St. Louis, Mo. 63104

Filed Jul. 18, 1980, Ser. No. 170,287
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **14 Claims**

1. Music playing apparatus for playing selected musical notes in accordance with a selected rhytym pattern comprising:

rhythm means for selecting a rhythm pattern having a multiplicity of intervals, the rhythm means including a circular rhythm scan shift register through which a bit is sequentially shifted to repetitively reproduce a selected rhythm pattern, the rhythm scan shift register having a number of stages corresponding to the number of intervals within the rhythm pattern and the rhythm means further including a set of multiposition switches, each switch representing an interval within the rhythm pattern and each switch having a first switch position designating no note to be played at that interval in the rhythm pattern, a second switch position designating that a note be played at that interval within the rhythm pattern and as an unaccented note, and a third switch position designating that a note be played at that interval within the rhythm pattern and as an accented note;

tone select means for selecting which of a plurality of musical notes is played at each interval within the rhythm pattern;



first tone control means for determining the pitch of a selected note to be played, the pitch of a selected note being within a predetermined band of octaves in the chromatic scale;

second tone control means for selectively extending the number of bands in the chromatic scale within which the note is played; and

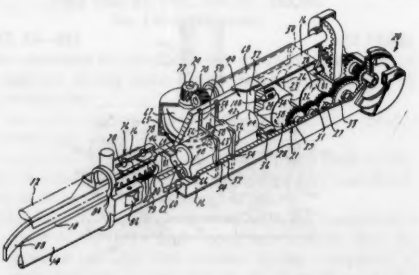
tone generating means responsive to the rhythm means, the tone select means and the first and second tone control means for generating audible musical tones in accordance with the established rhythm pattern, the selected musical notes and the octave band range within which the selected musical notes are found.

4,309,933

EXTERNALLY POWERED GUN LOADING AND EJECTION SYSTEM

William R. Bains, Lake Elsinore, Calif., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 11, 1979, Ser. No. 47,402
Int. Cl.³ F41D *7/02, 9/02*
U.S. Cl. 89—9 **11 Claims**



8. A loading and ejection system for a machine gun comprising;

a housing;

a motor means mounted onto said housing for powering said gun;

gearing means mounted onto said housing and operably

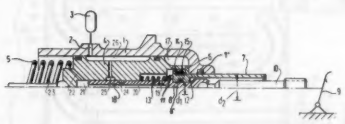
connected to said motor means for driving various operations of said gun in predetermined phases relationship;
feed means operably connected to said gearing means for supplying ammunition to said gun;
two parallel barrels fixedly mounted to said housing;
a firing chamber alignable with each barrel;
an ejection hole in said housing for ejecting spent cartridges from said feed means in a forward direction;
a belt mounted on said housing and operably connected to said motor means for movement in a forward axial direction away from said ejection hold such that upon starting of said gear, said belt frictionally grasps any ejecting cartridges from said ejection hole and axially accelerates them to ensure said cartridge is completely withdrawn from said ejection hole before said feed means moves to another position.

4,309,934

HYDRAULIC BRAKE BOOSTER

Werner Volkmar, Waldorf, and Helmut Steffes, Eschborn, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Aug. 17, 1979, Ser. No. 67,269
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841262
Int. Cl.³ F15B *9/10, 13/10*
U.S. Cl. 91—373 **9 Claims**



1. A hydraulic brake booster comprising:
a housing having a longitudinal axis;
a booster piston disposed coaxial of said axis in a slidable sealed relation to the inner surface of said housing;
a pressure-control device disposed coaxial of said axis within said booster piston;
an annular piston disposed coaxial of said axis having a first collar thereon disposed between a step in said housing and the adjacent end of said booster piston to enable said annular piston to bear against said adjacent end of said booster piston; and
a central piston disposed coaxial of said axis and within said annular piston and said booster piston, said central piston being movable within limits relative to said annular piston by a brake pedal and actuates said pressure-control device, said central piston and said annular piston being adapted to be coupled together after the force of a first spring is overcome by fluid pressure so that said central piston and said annular piston are movable as one, said first spring acting between a surface of said booster piston spaced inwardly from said adjacent end of said booster piston and a second collar at an end of said annular piston within said booster piston spaced from said first collar, said central piston being subjected to a pressure acting on said booster piston throughout a braking operation.

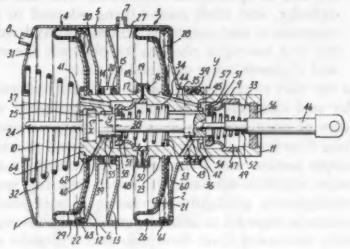
4,309,935

TWO CIRCUIT VACUUM BRAKE BOOSTER

Juan Belart, Walldorf, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Feb. 19, 1980, Ser. No. 122,096
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1979, 2908481
Int. Cl.³ F15B *9/10;* **F01B** *19/00*
U.S. Cl. 91—376 R **9 Claims**

1. A two-circuit vacuum brake booster comprising:
a housing having a longitudinal axis;
two pressure chambers disposed one behind the other coaxial of said axis within said housing;
at least one movable wall disposed in each of said two chambers to divide each of said two chambers into a vacuum chamber and a working chamber, each of said movable walls acting on a force-transmitting member; and
a control hub disposed in said housing coaxial of said axis



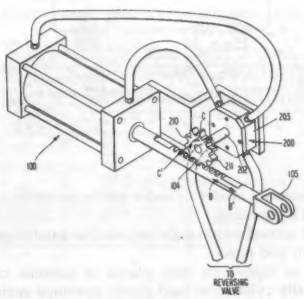
supporting said force-transmitting member and to which each of said movable walls are fastened, said hub having disposed therein a valve and duct system for separate evacuation of and joint supply of atmospheric pressure to said working chamber of each of said two chambers, said hub having only a single inlet coaxial of said axis for said atmospheric pressure to pressurize said working chamber of each of said two chambers.

4,309,936

STACKER WITH IMPROVED HYDRAULIC CYLINDER MOVEMENT

William J. Eberle, Reading, and Robert J. Mills, III, Birdsboro, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Filed Apr. 30, 1979, Ser. No. 34,415
Int. Cl.³ F15B *15/22*
U.S. Cl. 91—405 **8 Claims**



1. An apparatus for controlling the output movement of a fluid actuated hydraulic cylinder, said apparatus comprising:
(a) pumping means for pumping a fluid into said hydraulic cylinder;
(b) reversing means between said pumping means and said hydraulic cylinder for controlling the direction of fluid flow into said hydraulic cylinder; and
(c) velocity control means operatively connected to said hydraulic cylinder and responsive to the output motion of said hydraulic cylinder so as to cause a gradual acceleration at the start of said output motion and a gradual deceleration prior to the stopping of said motion;

(d) wherein said velocity control means is a valve comprising:

(i) a valve housing positioned between said pumping means and said hydraulic cylinder, said housing having a plurality of pairs of openings therethrough which communicate with both said hydraulic cylinder and said pumping means; and

(ii) rotatable shaft means mounted within said valve housing and in operational association with said hydraulic cylinder, said shaft means being adapted to rotate in response to said output motion of said hydraulic cylinder and having a plurality of channels therethrough, said channels being disposed so that;

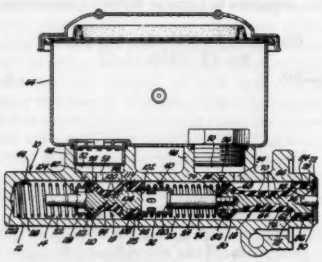
at the start of said output motion of said hydraulic cylinder said channels are substantially misaligned with said pairs of openings in said valve housing, preventing full fluid flow into said hydraulic cylinder and providing said output motion with a starting velocity having a minimum value which is substantially lower than full speed; said misalignment gradually decreasing as said shaft means rotates in response to said output motion, allowing a gradually increasing fluid flow into said hydraulic cylinder, accelerating motion of the hydraulic cylinder to a maximum speed as said channels pass through full alignment with said openings; said rotation then causing said channels to again gradually misalign with said openings so that said fluid flow gradually decreases and said output motion decelerates substantially to said minimum value just prior to the conclusion of said output motion.

4,309,937

COMPOSITE MASTER CYLINDER PISTONS

Michael M. Schardt, Centerville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 25, 1979, Ser. No. 87,997
Int. Cl.[3] F16J *1/02, 9/08*
U.S. Cl. 92—240 **2 Claims**



1. A composite master cylinder piston assembly including a piston and comprising:

first and second piston seals mounted in axially spaced relation on said piston;

a metal or equivalent hard plastic or ceramic core and a generally cylindrical hard plastic envelope encircling and secured to said core, said core and said envelope defining said piston, said envelope being made of glass-filled nylon or equivalent hard plastic;

said envelope having first and second axially spaced lands abutting and providing aligned axial support for said piston seals;

said core having opposed end sections provided respectively with third and fourth axially spaced lands respectively received axially and radially within said first and second lands and providing aligned axial and radial support thereto, said core further having a reduced diameter body portion of smaller diameter than said opposed end sections and said third and fourth lands and axially intermediate said third and fourth lands, and one or more grooves formed on said reduced diameter body portion, said core opposed end sections having axially opposite ends axially exposed relative to said envelope and constructed and arranged to transmit direct axial force therethrough;

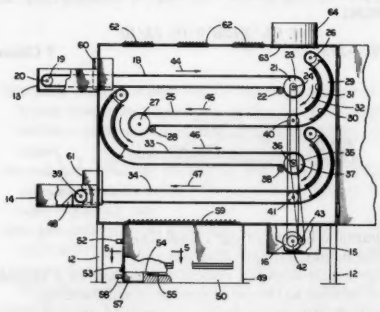
said envelope being molded in place on said core in final finished form and securely gripping said core through full radial and axial surface interface contact with said third and fourth lands and said core reduced diameter body portion, and having a substantially uniform wall thickness such that the radial thickness of the part of said envelope radially outward of said core reduced diameter body portion is substantially equal to the radial thickness of the other parts of said envelope and the diameter thereof is less than the diameter of either of said third and fourth lands of said core.

4,309,938

SMOKER DEVICE

John R. Harmon, 2421-4 Abbey Dr., Fort Wayne, Ind. 46815

Filed May 27, 1980, Ser. No. 153,078
Int. Cl.[3] A23B *4/04*
U.S. Cl. 99—477 **5 Claims**



1. A smoker device which comprises:

a smoke chamber having a bottom;

a smoke generator mounted adjacent the bottom of said smoke chamber and communicating therewith;

a first conveyor mounted within said smoke chamber and having a first receiving end and a second delivering end, said smoke chamber defining an entry opening and the receiving end of said first conveyor being located adjacent the entry opening;

a plurality of intermediate conveyors mounted within said smoke chamber, a first of said intermediate conveyors being positioned adjacent said first conveyor, said first intermediate conveyor having a main portion located below and spaced apart from said first conveyor and further having a second portion spaced adjacent and shaped complementary to the delivering end of said first conveyor, the main portion terminating in a delivering end, each successive one of said intermediate conveyors including a main portion adjacent and spaced below the preceding one of said intermediate conveyors and terminating in a delivering end, each successive one of said intermediate conveyors further including a second portion spaced adjacent and shaped complementary to the delivering end of the preceding one of said intermediate conveyors;

a delivery conveyor mounted within said smoke chamber, said delivery conveyor including a main portion terminating in a delivering end, the main portion being located below and spaced apart from a final one of said intermediate conveyors, said delivery conveyor further including a second portion spaced adjacent and shaped complemen-

tary to the delivering end of the final one of said intermediate conveyors;

said smoke chamber defining an exit opening and the delivering end of said delivery conveyor being located adjacent the exit opening;

means to drive said first and delivery conveyors to transport carried material in a direction from the first end to the second end and to drive each of said intermediate conveyors to transport carried material in a direction from the second, complementary-shaped portion to the main portion.

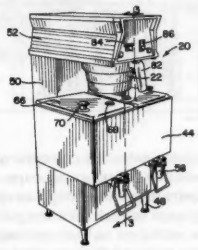
4,309,939
BEVERAGE BREWING APPARATUS

Kenneth W. Stover, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Continuation-in-part of Ser. No. 75,601, Sep. 14, 1979. This application Dec. 31, 1979, Ser. No. 108,590

Int. Cl.³ A47J *31/40, 31/56*

U.S. Cl. 99—280 **56 Claims**



1. In beverage brewing apparatus comprising housing means including a base portion and an upper portion carried by and above said base portion, cold water conduit means, a cold water fill basin in said upper portion to receive a selected quantity of cold water from said cold water conduit means, a hot water tank below said cold water tank, means communicating between the cold water basin and hot water tank to conduct said selected quantity of cold water to said hot water tank and to displace therefrom a corresponding quantity of hot water to a hot water dispensing port, and a dry beverage-making material receptacle carried by said upper portion beneath said dispensing port, the improvement comprising a pair of reservoirs carried by said base portion below and substantially on either side of said hot water dispensing port, said receptacle comprising on off-center liquid outlet and being pivotally mounted on said upper portion to permit the receptacle to be pivoted to position said outlet over either of said reservoirs to gravitationally discharge liquid beverage extract through said outlet into selected one of said reservoirs.

4,309,940
INFUSION TYPE BEVERAGE MAKER

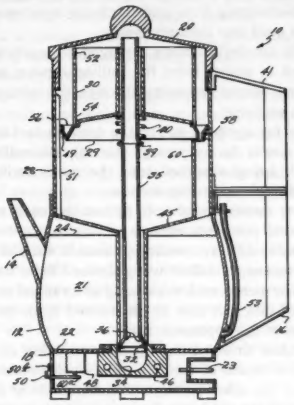
William M. Lowerre, Jr., 7458 Colton La., Sudley Station, Manassas, Va. 22110

Continuation of Ser. No. 753,504, Dec. 22, 1976, abandoned, and a continuation-in-part of Ser. No. 324,301, Jan. 17, 1973, abandoned. This application Nov. 29, 1979, Ser. No. 98,692

Int. Cl.³ A47J *31/10*

U.S. Cl. 99—281 **15 Claims**

1. Apparatus of the type which makes an infusion type beverage by heating water, passing the heated water once through a mass of solid material and storing the resulting beverage separately from the water being heated, said apparatus comprising: a beverage container having a bottom wall and a side wall and being capable of holding a predetermined maximum volume of beverage; a perforated basket located above said container for holding material from which the beverage is to be made; a water supply reservoir capable of holding a predetermined maximum volume of water, said maximum volume of said reservoir being substantially less than said maximum volume of said container; bypass passage means communicating with said reservoir and with said container in such a manner that water in excess of said maximum volume of said reservoir is passed to said container when water is delivered into said reservoir; heating means for heating the contents of said container and the contents of said reservoir; means for passing heated water from said reservoir through said basket means to said container whereby concentrated brew leaving said basket means mixes with the contents of said container; and control means for reducing the heat imparted to the contents of the reservoir and to the contents of said container when continued temperature elevation is not required.



4,309,941
CHEESE MAKING METHOD AND APPARATUS

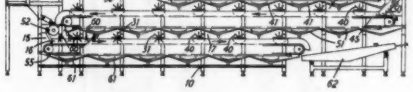
Ian P. Brockwell, Wyckoff, N.J., assignor to Alfa Laval AB, Tumba, Sweden

Filed Mar. 21, 1980, Ser. No. 131,927

Claims priority, application United Kingdom, Mar. 23, 1979, 10317/79

Int. Cl.³ A01J *25/11*

U.S. Cl. 99—453 **19 Claims**



1. Apparatus for the continuous manufacture of cheese from raw curd comprising structure defining a drying and de-wheying section, a fusing section, a cheddaring section, a milling section, a salting section, and a mellowing section, and including:

(a) first conveyor means in said drying and de-wheying section,

(b) means for feeding curd in a continuous stream onto said first conveyor means,

(c) agitator means operable to agitate curd on said first conveyor means to facilitate drainage of whey therefrom,

(d) second conveyor means in said fusing section, said second conveyor means being arranged to receive curd dis-

charged from said first conveyor means and permitting fusion of the curd thereon into a mat of curd,

(e) third conveyor means in said cheddaring section, said third conveyor means being arranged to receive the mat of curd discharging from said second conveyor means and to effect lateral expansion of the mat of curd thereon so as to stretch the curd,

(f) a milling device in said milling section arranged to receive curd discharging from said third conveyor means and to cut the curd into separate pieces,

(g) fourth conveyor means arranged to receive curd discharged in pieces from the milling device, said fourth conveyor means extending through the salting and mellowing sections,

(h) means for applying salt to the curd on said fourth conveyor means during passage through said salting secton, the salt being absorbed into the curd during passage through said mellowing section,

(i) agitator means operable to agitate the curd and salt on said fourth conveyor means,

(j) a plurality of trays arranged beneath each of said conveyor means to collect whey drained from curd on the conveyor means, said trays being so arranged to segregate whey of different acid levels drained from the different sections of the apparatus, and

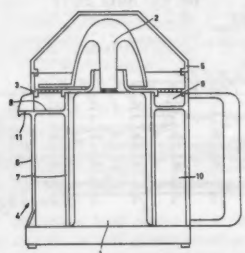
(k) individual drive means operable to drive each of said conveyor means at variable speeds independently of the speed of the other conveyor means, whereby acid development in the curd may be regulated by controlling the residence time of the curd in each section in accordance with the acid levels of the whey in said trays.

4,309,942

CITRUS PRESS

Artur F. Da Silva, Jr., Sao Paulo, Brazil, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 14, 1980, Ser. No. 167,951
Claims priority, application Brazil, Jul. 19, 1979, 7904613
Int. Cl.³ A23N *1/00*
U.S. Cl. 99—501 **1 Claim**



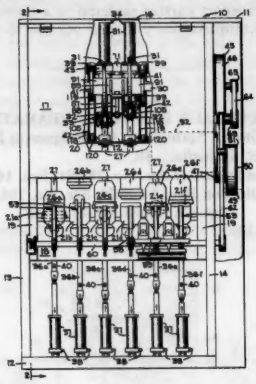
1. A citrus press which comprises a pressing cone drivable by a motor; a juice filter; a juice receptacle for placement underneath the filter, the juice receptacle being constituted by two concentric cylinders forming an annulus; an annular partition interconnecting the two cylinders and dividing the annulus into a larger section and a smaller section; and a spout associated with the smaller section, the spout being located at the partition; the juice receptacle being placeable in a first position for collecting and holding juice in the larger section and, upon inversion, in a second position for collecting juice in the smaller section for continuous discharge via the spout.

4,309,943

CITRUS FRUIT JUICE EXTRACTOR

Gregory J. Larsen, and William M. Easter, both of Lakeland, Fla., assignors to FMC Corporation, Chicago, Ill.

Filed Feb. 13, 1980, Ser. No. 120,966
Int. Cl.³ A23N *1/02*; B30B *9/02*
U.S. Cl. 99—509 **14 Claims**



1. A citrus fruit juice extractor comprising:

a plurality of aligned pairs of opposing cups, each of said cups including spaced apart fingers defining a cavity for receiving a fruit, said opposing cups in each pair being adapted to interdigitate to compress said fruit as they are moved together to thereby extract juice from the fruit, strainer tubes respectively communicating with one of said cups of each of said pairs of cups for providing passages for juice extracted from the fruit, means for moving said opposing cups together to compress the fruit therebetween and cause the juice to be directed to the strainer tubes, said means for moving said cups together including a drive shaft and a motor for reciprocating said shaft at a selected speed, a plurality of driving means operatively connected to said shaft for sequentially driving one cup of each of said pairs of cups toward the opposing cup, each of said plurality of driving means being connected to said drive shaft at a position angularly offset from those of the others of said driving means to cause said pairs of cups to compress the fruit therebetween at different rotative positions of the shaft so that said shaft is subjected to a relatively uniform unidirectional torque, orifice tubes slidably received within said strainer tubes for applying pressure to said juice and pulp to express juice from said strainer tubes, and means operatively connected to said drive shaft for sequentially reciprocating said orifice tubes within said strainer tubes in synchronous relationship to the driving of the cups associated with the strainer tubes.

4,309,944

HIGH SPEED FRUIT FEEDING APPARATUS

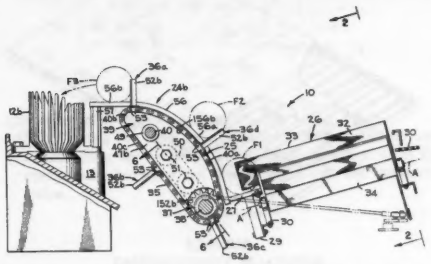
Elmer F. Frost, Jr., and Gregory J. Larsen, both of Lakeland, Fla., assignors to FMC Corporation, Chicago, Ill.

Filed Feb. 13, 1980, Ser. No. 120,965
Int. Cl.³ B30B *9/06*
U.S. Cl. 100—104 **11 Claims**

1. An apparatus for successively feeding rounded objects such as fruit from a plurality of pick-up stations to a plurality of reception areas comprising: a plurality of endless chains; a plurality of means for respectively guiding said chains through preselected curvilinear paths that lie in transversely spaced vertical planes; a finger rigidly attached to each chain to extend outwardly thereof in said curvilinear path; a plurality of means for supporting fruit to be fed at pick-up stations that are aligned with said paths; means for concurrently driving said chains upwardly over the respective guiding means; each

curvilinear path extending from adjacent said fruit supporting means upwardly to a height above the reception areas to which the fruit are to be fed and thereafter extending downwardly through a sharp curvature to cause said finger to pivot rapidly forwardly to accelerate the fruit toward its reception area.

4. An apparatus for successively feeding fruit to a fruit juice extractor, said juice extractor including a lower extractor cup, an upper extractor cup which is reciprocatably mounted above said lower cup, and means for operating said upper cup to reciprocate said upper cup to extract juice from a fruit received in the lower cup, said feeding apparatus comprising: a drive shaft operatively connected to said means for driving said upper cup; an endless chain operatively connected to said drive shaft to move in synchronized relationship to the move-



ment of the upper cup of said extractor; said endless chain having a finger extending outwardly thereof; chain guide means for guiding said chain through a loop that is aligned with the cups of the extractor; a fruit support associated with said chain for supporting fruit to be fed to said extractor; said chain guide means being mounted so that the finger engages a fruit on the fruit support, lifts the fruit therefrom, elevates the fruit toward the adjacent lower cup of the extractor and propels the fruit into the adjacent lower cup while the opposed upper cup is elevated, and said chain guide means having a shape to cause the finger to first move through a broadly curved path until the fruit is at a height at which it may be propelled into the associated lower extractor cup and to thereafter cause the finger to pivot rapidly forward to accelerate the fruit.

4,309,945

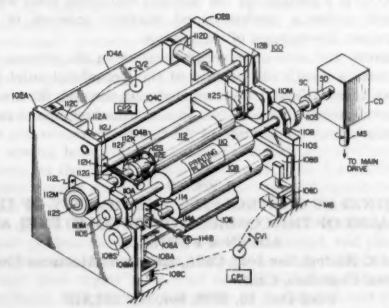
FLEXOGRAPHIC PRINTING UNIT

Thomas E. Marion, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Continuation of Ser. No. 892,941, Apr. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 840,808, Oct. 11, 1977, abandoned. This application May 25, 1979, Ser. No. 42,980

Int. Cl.[3] **B41F** *13/14, 13/32, 13/40;* **B41L** *35/12*

U.S. Cl. 101—247 **32 Claims**



1. In a printing means for printing repetitive patterns on a travelling web printing medium, including a driven printing plate cylinder and inking and impression cylinders driven thereby, all of said cylinders being substantially mutually parallel and positioned between upstanding spaced side plates on a machine frame, the improvement comprising:

an integral axial shaft on said inking cylinder;

a first pair of swinging arms pivotally mounted between said side plates and journalling opposite ends of said integral inking cylinder shaft for rotation therein;

first fluid actuating means selectively positioning said first swinging arms and said inking cylinder with respect to said plate cylinder;

an axial mounting shaft in said impression cylinder;

a second pair of swinging arms pivotally mounted between said side plates and journalling said mounting shaft for limited rotation therein;

second fluid actuating means selectively positioning said second swinging arms and said impression cylinder with respect to said plate cylinder;

fine adjustment means for said impression cylinder comprising a cylindrical bushing eccentric with said axial mounting shaft within each end of said impression cylinder, bearing means mounting said impression cylinder for free rotation on said bushings and adjusting means on at least one of said arms for imparting a selected rotational adjustment to said mounting shaft and said bushings to cause selective translation of said impression cylinder toward and away from said place cylinder;

an integral axial drive shaft on said plate cylinder; and

bearing traction means on opposite ends of each of said shafts interengaged to drive said inking cylinder therethrough and to index said inking and impression cylinders with respect to said plate cylinder;

said impression cylinder being freewheeling to be driven by said plate cylinder through web of printing medium nipped therebetween.

4,309,946

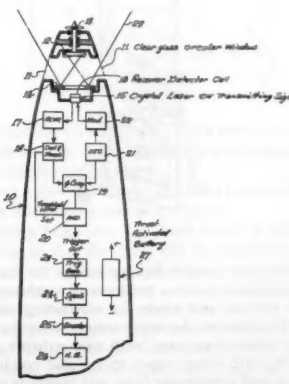
LASER PROXIMITY FUZING DEVICE

Kenneth A. Block, Claremont, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Jul. 13, 1967, Ser. No. 653,249

Int. Cl.[3] **F42C** *13/02*

U.S. Cl. 102—213 **2 Claims**



1. A range-measuring and detonating system comprising: a rolling type air vehicle having a transparent section in the forward portion thereof; air driven propeller means operably mounted in the forward end of said air vehicle for rotation about an axis; a first reflector means operatively mounted in said air vehicle forward of said transparent section and con-

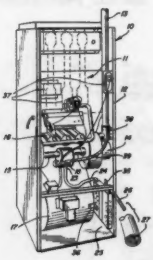
nected to the aft end of said propeller means for rotation with said propeller means about said axis; a second reflector means having a central opening therein operatively mounted in said air vehicle both aft of said transparent section and aft of said first reflector means for directing reflections to said first reflector means and for passing reflections from said first reflector means through said central opening; laser means operably mounted in said air vehicle aft of said second reflector means for directing a beam through said central opening of said second reflector means toward said first reflector means for reflection by said first reflector means; detecting means mounted adjacent said laser means for intercepting and detecting reflections received from said first reflector means through said central opening of said second reflector means and for producing an output signal; receiver means operably connected to said detecting means to receive the output signal from said detecting means and to produce another output signal; detector and threshold assembly means operably connected to said receiver means to receive the output signal from said receiver means and to produce a further output signal; an oscillator mounted in said air vehicle; modulator means operably connected to said detecting means and to said oscillator, said modulator means being responsive to said oscillator; a phase comparator responsive to said oscillator and to the output signal from said detector and threshold assembly means; an AND circuit operatively connected to receive the output from said phase comparator and from said detector and threshold assembly; a trigger generator operably connected to said AND circuit and responsive thereto; a squib operably connected to said trigger generator and responsive thereto; a booster assembly operably connected to said squib and responsive thereto; and an explosive charge operably connected to said booster assembly and responsive thereto, whereby said explosive charge is ignited and detonated.

4,309,947

MOUNTING ARRANGEMENT FOR CONDENSATE NEUTRALIZER IN A FURNACE

Edward A. Ketterer, St. Joseph Township, Berrien County, Mich., assignor to Heil-Quaker Corporation, Lewisburg, Tenn.

Filed Mar. 26, 1980, Ser. No. 134,078
Int. Cl.³ F23J *15/00*
U.S. Cl. 110—203 **11 Claims**



1. In a domestic furnace having means for burning fuel resultingly producing gaseous products of combustion having water vapor therein, and means for exhausting said gaseous products of combustion, the improvement comprising:

separating means associated with said exhaust means for converting said water vapor to a liquid condensate and removing said condensate from said products of combustion;

conducting means for conducting said condensate from said separating means;

condensate treatment means for receiving said condensate from said conducting means and reducing the acidity thereof; and

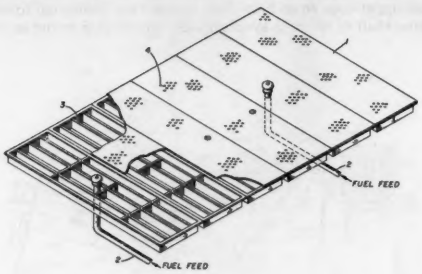
means for imparting mechanical movement to said condensate treatment means during the operation of said furnace to maintain the neutralizing effectiveness thereof.

4,309,948

SOLIDS FEED NOZZLE FOR FLUIDIZED BED

Edward A. Zielinski, Harwinton, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 7, 1980, Ser. No. 176,224
Int. Cl.³ F23D *1/00*
U.S. Cl. 110—263 **5 Claims**



1. A fuel feed system for a fluidized bed of granulated solid fuel, including,

a support structure horizontally extended and perforated and arranged beneath a bed of granulated solid fuel,

a bed of granulated solid fuel extended over the upper side of the support structure while being combusted,

a source of combustion air connected to the under side of the support structure with the arrangement to flow the combustion air up through the perforations of the support structure at a rate and quantity which will expand the bed while it is combusting,

a fuel pipe mounted to extend up through the perforated structure and terminate a predetermined distance above the perforated structure and within the expanded and combusting bed,

a source of fluid-entrained granulated solid fuel connected to the fuel pipe below the support structure to flow the fuel upward and discharge from the upper end of the fuel pipe,

a cap structure supported above the upper end of the fuel pipe and horizontally extended to provide its under surface as a diverter of the entraining fluid and granulated fuel to be thereby radially distributed through the expanded bed,

and a sub-structure supported about the upper outlet of the fuel pipe and spaced from the under side surface of the cap to form a passage for the fuel and entraining fluid which will create a predetermined lowered pressure in the stream downstream of the passage,

whereby the area of lowered pressure in the stream will cause a significant portion of the granulated solid fuel particles to flow in an elongated path through the area of combustion within the bed adjacent the fuel pipe to cause satisfactory combustion of the fuel particles.

4,309,949

METHOD OF CONTROLLING THE OPACITY OF THE EXHAUST OF THE COMBUSTION OF SOLID FUEL AND AIR IN A FURNACE

Laxmi K. Rastogi, San Jose, Calif., assignor to Measurex Corporation, Cupertino, Calif.

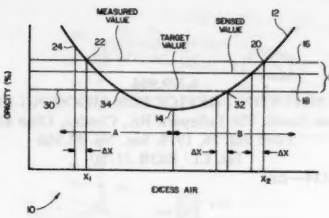
Filed Dec. 10, 1979, Ser. No. 101,810
Int. Cl.³ F23B *7/00*
U.S. Cl. 110—341 **12 Claims**

1. A method of reducing the opacity of the exhaust of the

combustion of solid fuel and air in a furnace from a measured value said furnace having means to adjust the known amount of air introduced into said furnace, said method comprising:

(a) measuring the opacity of the exhaust;

(b) initially changing in a direction the amount of air introduced into said furnace;



(c) sensing the opacity of the exhaust;

(d) comparing the sensed value to said measured value; and

(e) controlling the amount of introduced air based upon the comparison between the sensed value and the measured value.

4,309,950

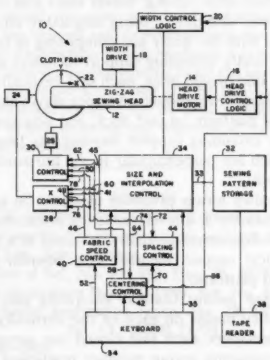
EMBROIDERY MACHINE

Paul F. Franklin, Cleveland Hts., Ohio, assignor to Meistergram Inc., Ohio

Filed Nov. 30, 1979, Ser. No. 99,087

Int. Cl.[3] D05C *9/06*; D05B *21/00*

U.S. Cl. 112—103 **32 Claims**



28. An embroidery machine for embroidering a predetermined design on fabric having at least first and second distinct spaced-apart portions comprising a sewing head having a reciprocating needle driven by a motor, a cloth frame for supporting fabric to be embroidered with said predetermined pattern for movement relative to said sewing head, first and second drive means for moving said cloth frame segmentally in first and second coordinate directions, respectively, to enable the sewing head to segmentally embroider a predetermined pattern on the fabric supported by said cloth frame, sewing pattern storage means for storing a plurality of signals each of which is representative of an incremental coordinate displacement of said cloth frame corresponding to individual segments of said predetermined pattern to be embroidered, said plurality of segments each representing a single segmental displacement of said cloth frame in at least one of said first and second coordinate directions, said plurality of signals and said plurality of single segmental displacements occasioned thereby representing said predetermined pattern to be embroidered, and control means responsive to said plurality of signals from said sewing pattern storage means for actuating said first and second drive means, said control means including spacing control means responsive to said plurality of signals in said sewing pattern storage means for establishing the maximum height and width of each of said first and second distinct spaced-apart portions of said predetermined pattern to be embroidered and actuating said first and second drive means to move said cloth frame and inhibit the reciprocation of the needle to space apart said first and second distinct spaced-apart portions of said predetermined pattern, in dependence upon the maximum height and width of each of said first and second distinct spaced-apart portions of said predetermined pattern to be embroidered and the desired spacing between said first and second distinct spaced-apart portions of the pattern to be embroidered, said spacing control being operable to vary the spacing between said first and second distinct spaced-apart portions of said predetermined pattern in both said first and second coordinate directions.

4,309,951

METHOD FOR DEBURRING SHEET METAL PARTS, SUCH AS CAN COVERS

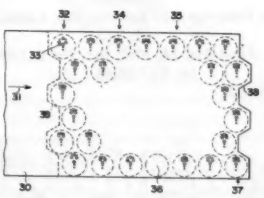
Helmuth Supik, Brunswick, and Hans-Juergen Schlinsog, Cremlingen, both of Fed. Rep. of Germany, assignors to Schmalbach-Lubeca GmbH, Brunswick, Fed. Rep. of Germany

Filed Nov. 26, 1980, Ser. No. 210,865

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950214

Int. Cl.[3] B21D *51/40*; C25F *3/14*

U.S. Cl. 413—18 **4 Claims**



1. A method for manufacturing sheet metal covers for containers, such as cans, in a continuously progressing operation, comprising the following steps:

(a) moving a sheet metal such as a band from a coil or a sheet from a stack into a stamping station,

(b) stamping holes into the sheet metal in predetermined locations so that the holes will be located in said covers and so that each stamped hole has a sharp edge adjacent the top surface of the sheet metal and a burred edge adjacent the bottom surface of the sheet metal,

(c) moving the stamped sheet metal with the holes therein through an electrolytic immersion bath for cleaning the sheet metal and for simultaneously chamfering said sharp edge and said burred edge by means of an increased electrolytical current density at these edges,

(d) subjecting the sheet metal to a cleaning operation,

(e) plating the cleaned sheet metal whereby the chamfered edges are also coated, and

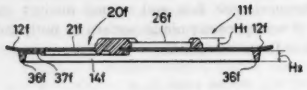
(f) stamping the covers out of the sheet metal so that the previously stamped holes are located in the covers.

4,309,952

PROCESS FOR MAKING A CONTAINER COVER MEMBER HAVING SYNTHETIC RESIN OPENABLE PORTION

Keiichi Takahashi, Ichikawa; Hiroshi Aoyama, Tokyo; Kikuya Hirakawa, Ebina, and Yukio Sarusawa, Zama, all of Japan, assignors to Tokan Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 969,150, Dec. 13, 1978, Pat. No. 4,244,491.
This application Jun. 22, 1979, Ser. No. 51,165
Claims priority, application Japan, Dec. 15, 1977, 52-149914; Feb. 27, 1978, 53-20996; Mar. 22, 1978, 53-35572[U]; Apr. 12, 1978, 53-42177; Apr. 14, 1978, 53-5343321
Int. Cl.[3] B21D *51/38*
U.S. Cl. 413—12 2 Claims



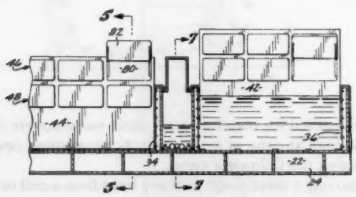
1. A process for producing a container cover member comprising the steps of stamping a sheet material stock to form a plurality of through bores each having a size corresponding to the opening to be formed in a cover sheet by a first stamping device, injection-molding at least one rib on said sheet material at least in the vicinity of said through bores, injection molding a closure member including an unsealing handle in each of said through bores, and then stamping said cover sheet to form the cover member by a second stamping device, wherein the height of the rib extending from the underside of said cover sheet downwardly is greater than the height of the closure member extending upwardly from the upperside of said cover sheet.

4,309,953

CARGO HANDLING SYSTEM FOR A MARINE CARGO VESSEL

John R. Van Plantinga, 255 Emerald Bay, Laguna Beach, Calif. 92651

Filed Jan. 14, 1980, Ser. No. 111,686
Int. Cl.[3] B63B *27/36*
U.S. Cl. 114—72 10 Claims



1. A marine cargo vessel having a hull provided with a normal waterline and a normal cargo load-unload level, said vessel comprising:

a hold unit in said hull that is sealed relative to said hull;

a cargo capsule floatably disposed within said hold unit having cargo deck means, formed with side-opening cargo hatch means, and a floatation-ballast chamber below said cargo deck means;

first water-transfer means to move water into and out of said hold unit so as to effect vertical movement of said cargo capsule relative to said hull;

second water transfer means to move water into and out of said floatation-ballast chamber relative to said hold unit; and

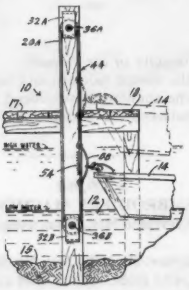
ballasting means for adjusting the elevation of said hull relative to said waterline, with said ballasting means being operable to dispose said hull at its cargo load-unload level.

4,309,954

SELF-ADJUSTING DEVICE FOR MOORING BOATS

A. William Szuch, 506 Lakepark Rd., Curtice, Ohio 43412

Filed Jul. 16, 1979, Ser. No. 57,703
Int. Cl.[3] B63B *21/00*
U.S. Cl. 114—230 1 Claim



1. A self-adjusting mooring device for mooring a boat in the water at a fixed dock having lateral sides and a horizontal platform thereon, said device being adapted to allow the boat to rise and fall with the water and comprising in combination:

(a) two vertically extending support members affixed to at least one side of said dock, each said vertically extending support member extending a distance above and below the horizontal platform on said dock, and wherein each such vertically extending support member has lateral vertical sides which are perpendicular to the horizontal platform of the dock;

(b) upper pulley means pivotally mounted on said vertical support member at a level above the horizontal platform;

(c) lower pulley means pivotally mounted at a position on said vertical support member at a position below said horizontal platform;

(d) closed line means rotatably encircling said upper and lower pulley means on each of the vertically extending support members, each said closed line means having a linearly extending spring member positioned linearly in said closed line means joining opposite ends of said closed line means into a closed loop, and wherein said closed line loop means are confined respectively by said upper and lower pulley means and the lateral vertical sides on the respective vertically extending support members upon which each said closed line loop means is positioned and wherein each such closed line loop means is free to move around the respective upper and lower pulley means on each said vertically extending support member;

(e) loop means joining the respective ends of the closed line means at points where the spring member joins the closed line means;

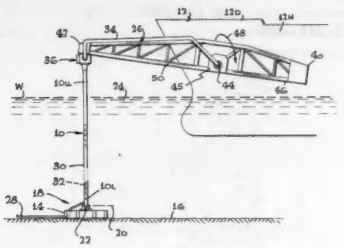
(f) connection means on each said closed line means to connect a portion of the boat to each of said closed line means for mooring said boat to the fixed dock, whereby a boat line is connected directly to each said closed line means and thereby allowing said boat line and the boat to move with the closed line means movement as various water levels dictate.

4,309,955

RISER-TO-VESSEL-MOORING-TERMINAL

James M. Kentosh, Los Angeles, Calif., assignor to Amtel, Inc., Providence, R.I.

Filed Feb. 29, 1980, Ser. No. 125,996
Int. Cl.³ B63B 21/50
U.S. Cl. 114—230 6 Claims



1. A mooring system for mooring a vessel floating offshore in a body of water, comprising:

a mooring leg extending primarily vertically between a location near the bottom of said body of water and a location at a height at least near the surface of the body of water;

a rigid structural member coupled to said vessel and having an inner end connected to the upper end portion of said mooring leg;

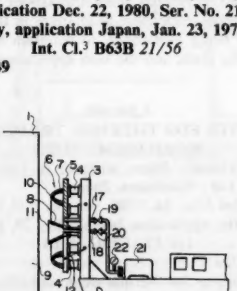
said structural member having a weighted outer end opposite said inner end and lying outboard of said vessel, and having an intermediate location between said ends which is pivotally connected about a substantially horizontal axis to said vessel, the outer portion of said structural member which lies beyond said horizontal axis, having a weight-distance distribution which produces a greater torque on said structural member tending to lift the inner end thereof than is produced about said axis by the inner portion of said structural member by its own weight and the net weight of said mooring leg, whereby to exert an upward force on said leg.

4,309,956

SHOCK ABSORBING DEVICE FOR TUGBOAT

Noboru Yamaguchi, Yokohama, Japan, assignor to Bridgestone Tire Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 971,598, Dec. 20, 1978, abandoned.
This application Dec. 22, 1980, Ser. No. 218,906
Claims priority, application Japan, Jan. 23, 1978, 53-6017
Int. Cl.³ B63B 21/56
U.S. Cl. 114—249 8 Claims



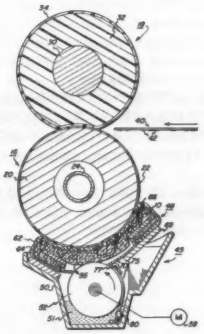
1. In a shock absorbing device for a tugboat used in the navigation of vessels wherein a main cushion member and at least one auxiliary cushion member arranged radially inwardly of said main cushion member are secured to a front of a face plate disposed on a deck end of said tugboat, and wherein the area located between the main cushion member and the auxiliary cushion member and the area enclosed by the auxiliary cushion member are connected through respective suction conduits to a vacuum pump, the improvement comprising: said auxiliary cushion member being provided with a close-fitting contact end facing the broadside of a vessel, said close-fitting contact end being arranged axially outwardly of a close-fitting contact end of said main cushion member in the direction of said broadside, said main cushion member being composed of an annular and hollow resilient body formed of rubber or rubber-like material, said main cushion member being closed in cross-section at said contact end and terminating in bifurcated ends in contact with said face plate, said main cushion member having a thickness in cross-section which is smallest at said contact end, and which becomes larger in the direction away from said contact end toward said bifurcated ends.

4,309,957

WICK FOR DISPENSING FUSER OIL

Joseph A. Swift, Union Hill, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1977, Ser. No. 756,212
Int. Cl.³ G03G 15/10
U.S. Cl. 118—60 2 Claims



1. In a fuser assembly where toner images produced by an electrostatic imaging and development system are fused by the application of heat and pressure comprising a fuser member, a pressure member, means to heat the fuser member, and wicking means to apply a release fluid on the surface of the fuser member, the improvement comprising a composite wicking material comprising a first layer which contacts the fuser member surface and a second layer adjacent the first layer and in contact therewith, the first and second layers having different compositions, with at least some of the material of at least one of the layers being forcefully driven into the material of the other layer by the process of needling.

4,309,958

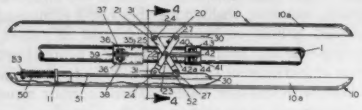
COATING LANCE CENTRALIZER

Charles E. Jennings, Houston, Tex., assignor to PA Incorporated, Houston, Tex.

Filed Jun. 16, 1980, Ser. No. 160,044
Int. Cl.³ B05C 7/02
U.S. Cl. 118—306 7 Claims

1. A centralizing apparatus for a coating lance having an elongated tubular element movable coaxially through the bore of a pipe to be coated, comprising, in combination: a pair of elongated skids of arcuate cross section, the external surfaces of said skids being contoured to slidably engage the pipe bore; vertically expansible linkage means interconnecting said skids for moving said skids from a collapsed position adjacent to said tubular element to an expanded position in engagement with

the pipe bore; means connected to said linkage means for supporting the tubular element in a central position relative to said skids; and a pair of actuating means secured to said tubular element on opposite sides of said linkage means, one of said actuating means being operable by movement of said tubular element in one axial direction to shift the linkage to its skid



expanded position, and the other said actuating means being operable by movement of said tubular element in the other axial direction to shift said linkage means to its skid collapsed position, said linkage means comprising a pair of X-shaped links having a medial pivot pin, said means for supporting said tubular element comprising a saddle suspended between said pivot pins.

4,309,959

APPARATUS FOR APPLYING CHEMICAL PLATING TO INNER SURFACES OF TUBULAR MEMBERS

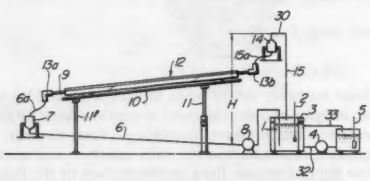
Ryozo Yamagishi; Mamoru Mita; Osamu Yoshioka, and Tetsuo Ishikawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 22, 1980, Ser. No. 152,298

Claims priority, application Japan, May 29, 1979, 54/66610

Int. Cl.³ B05C *7/04*

U.S. Cl. 118—664 **13 Claims**



1. Apparatus for applying chemical plating to surfaces of tubular members, comprising:

a tank for storing a plating solution;

a mounting table for supporting a plurality of tubular members to be simultaneously plated;

a plurality of first tube end connectors each detachably fitted over a plating solution inlet end of each of said tubular members to be plated and a plurality of second tube end connectors each detachably fitted over a plating solution outlet end of each of said tubular members to be plated;

a plating solution distributing member connected to all said first tube end connectors;

a plating solution collecting member connected to all said second tube end connectors;

a first line connecting said plating solution storage tank to said plating solution distributing member;

a pump mounted in said first line; and

a second line connecting said plating solution collecting member to said plating solution storage tank and having an inverted U-shape in the vicinity of the connection between said second line and said collecting member.

4,309,960

APPARATUS FOR SCRAPING EXCESS COATING SUBSTANCE OFF A RUNNING WEB

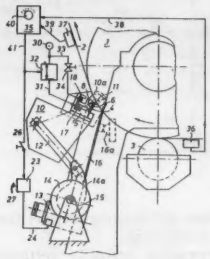
Hartmut Waldvogel, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Apr. 3, 1980, Ser. No. 136,888

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1979, 2913421

Int. Cl.³ B05C *11/04*

U.S. Cl. 118—665 **23 Claims**



1. Apparatus for scraping excess coating substance off a running web, comprising:

a scraper blade extending across the web transverse to the running direction thereof and having a free end portion with a scraping surface;

means for running a web coated with a coating substance past the scraping surface for the scraping surface to scrape excess coating substance off the web;

pressure means for exerting a force on the blade for pressing the scraping surface against the web;

means for supporting the blade at a distance from the free end portion of the blade and for moving the blade, through movement of this means, for adjusting the blade angle between the blade, at the free end portion thereof, and the web; the moving means being adapted to rotate the blade about an axis of rotation transverse to the running direction of the web, and the rotation axis being located near the free end portion of the blade;

means for monitoring a selected parameter representative of the blade angle between the blade, in the vicinity of the free end portion, and the web; and

control means connected with the moving means for causing the blade to be rotated about the axis of rotation by the moving means responsive to changes in the value of the parameter being monitored, to maintain the blade angle between the blade and the web approximately constant.

4,309,961

APPARATUS FOR THERMAL TREATMENT OF SEMICONDUCTORS

Ryozo Satoh, Yamato, Japan, assignor to Tel-Thermco Engineering Co., Ltd., Yokohama, Japan

Filed Mar. 24, 1980, Ser. No. 132,734

Claims priority, application Japan, Mar. 29, 1979, 54-36259

Int. Cl.³ C83C *13/08*

U.S. Cl. 118—733 **5 Claims**

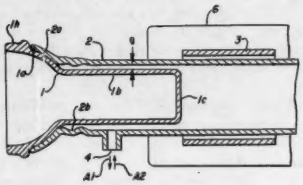
1. In an apparatus for thermal treatment of semiconductors in a treating gas, of a type comprising

(a) a treating tube, which is adapted to hold semiconductors, which has a tubular wall, which has a flanged portion located at one end of the tubular wall and exposed to an outer atmosphere, and which has an outlet provided in the tubular wall for the treating gas and spaced from the flanged portion, and

(b) a sealing closure, which has a flanged portion adapted to be interfitted with the flanged portion of the treating tube

so as to seal said end, and which is removable from the treating tube so as to open said end,

the improvement wherein the sealing closure has a cylindrical portion, which has a tubular wall, and which is adapted to be inserted into the treating tube through said end so as to substantially fill the treating tube, as far as the cylindrical portion extends into the treating tube, except for a clearance provided around the cylindrical portion, between the cylindrical portion and the tubular wall of the treating tube, said clearance preventing ready formation of convection currents in the treating gas, and wherein the tubular wall of the cylindrical portion of



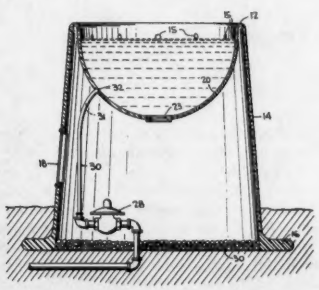
the sealing closure has a first end, which is open, and which adjoins the flanged portion of the sealing closure, a second end, which is closed, and a hollow interior, which is open to the outer atmosphere at the first end through the flanged portion of the sealing closure, and which does not communicate through the sealing closure with the outlet for the treating gas, the flanged portion of the sealing closure and the flanged portion of the treating tube each having a surface to be interfitted with a surface of the other, and each having a surface opposite its surface to be interfitted, said opposite surfaces being exposed to the outer atmosphere when said flanged portions are interfitted with each other.

4,309,962

LIVESTOCK WATERING STATION

John D. Boozer, 336 NE. 44th Ave., Ocala, Fla. 32670

Filed Oct. 6, 1980, Ser. No. 194,434
Int. Cl.³ A01K *7/02*
U.S. Cl. 119—74 **5 Claims**



1. A housing for a livestock drinking station, comprising:

a hemispherically-shaped drinking basin including a water outlet located substantially in the bottom center of the basin and a swirl-type water inlet integrally formed in one side thereof;

a continuous side wall extending around the periphery of said basin, said side wall being tapered outwardly from the top of said basin toward the bottom thereof and including a continuous shoulder for supporting the basin within the ground, said continuous side wall and said basin forming a smooth top edge surface and said basin and continuous side wall being integrally made of shock-proof, reinforced fiberglass material affording a smooth, non-porous external surface; and

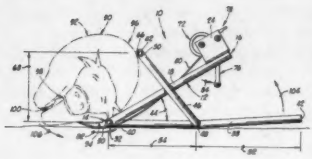
a fast-flow drain being removably mounted within said water outlet and including an adjustable orifice for varying the flow of water from said fast-flow drain.

4,309,963

ANIMAL HANDLING APPARATUS

William J. Forrest, 3400 NW. Expressway, Oklahoma City, Okla. 73112

Filed Nov. 21, 1980, Ser. No. 209,004
Int. Cl.³ A01K *15/00*
U.S. Cl. 119—96 **8 Claims**



1. An animal handling apparatus for turning over from one side to the opposite side a relatively large animal with front and rear legs, a back, a stomach, and opposite sides, comprising:

a frame having a first end and a second end;

a first brace connected to the frame generally near the first end of the frame, the first brace being positioned on the frame to be engageable with a portion of the animal to be turned;

a winch connected to the frame;

a cable having one end connected to the winch, the opposite end of the cable being connectable to at least some of the animal's legs and the winch for pulling the cable with the animal's legs connected thereto toward the animal's body; and

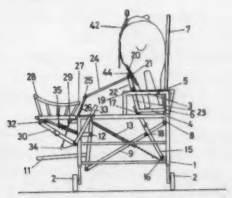
a handle having one end connected to the frame and the handle extending a distance from the frame terminating with an opposite end, the handle being manually movable in a direction to cooperate in turning the animal over from one side to the other side after the winch has pulled the cable to bring the animal's legs connected to the cable to a position generally near the animal's body, the first brace being engageable with the animal to maintain the cable taut as the handle is moved to pull the animal's legs in a direction generally under the animal and as the animal is turned over from one side to the opposite side.

4,309,964

MACHINE FOR CRUTCHING SHEEP AND OTHER ASSOCIATED VETERINARY PURPOSES

Henry S. C. Young, Box 108, Keith, Australia (5267)

Filed Jul. 25, 1980, Ser. No. 172,415
Int. Cl.³ A61D *3/00*
U.S. Cl. 119—103 **10 Claims**



1. A machine for crutching sheep and for other associated veterinary purposes wherein a sheep is moved on a race and is

discharged from the race into an adjacent cradle in an inverted position and after treatement is discharged from the cradle by again inverting it, characterised by:

(a) a race platform supported by hinge means on a frame to be tiltable from a loading position about a longitudinal axis and including a roll plate carried on a connecting strip extending along one longitudinal edge of the said race platform at substantially leg height of a sheep, said hinge means being positioned to lower the said edge of the race platform when the said race platform is tilted to discharge a sheep from the said race platform,

(b) a cradle also supported on the said frame but spaced from the said race platform to be tiltable about a longitudinal axis,

(c) a ramp disposed between the said race platform and the said cradle hingedly connected at one longitudinal edge to the said frame adjacent to one upper edge of the said cradle and hingedly connected along the opposite edge to the said connecting strip adjacent to the said roll plate, and

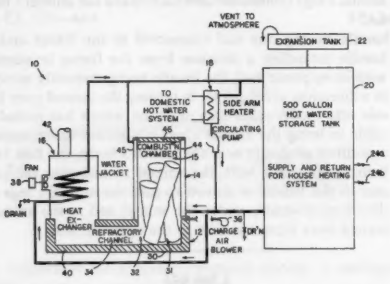
(d) means to hold the said race platform in a loading position but releasable to tilt the said race platform whereby when said race platform is tilted about the said longitudinal axis a sheep standing on the said race platform is caused to fall sideways over the said roll plate onto the said ramp and is rolled over the said ramp into the said cradle assisted by the increasing inclination of the said ramp as the said race platform returns to its loading position.

4,309,965

VERTICAL FEED STICK WOOD FUEL BURNING FURNACE SYSTEM

Richard C. Hill, Orono, Me., assignor to Board of Trustees of the University of Maine, Bangor, Me.

Filed Sep. 14, 1979, Ser. No. 75,815
Int. Cl.³ F22B *5/00*
U.S. Cl. 122—15 **29 Claims**



26. A new and improved furnace system for high efficiency combustion of wood or other solid fuel and high efficiency energy recovery from the end products of combustion comprising:

a substantially vertical column combustion chamber, the major upper portion of said vertical column comprising a water jacket for at least convection circulation of water or other heat transfer fluid, the base portion of said combustion chamber comprised of refractory material forming the locus of combustion, said combustion chamber adapted to receive and support elongate pieces of fuel in a vertical attitude or fuel pieces in a vertical stack and confine combustion to the chamber base by the quenching action of the water jacket, said combustion chamber formed with a draft outlet at the base of the chamber;

said combustion chamber base and locus of combustion forming part of a furnace sequence in a refractory high temperature environment, said furnace sequence comprising in order from upstream to downstream in the air and flue gas flow as follows:

means for forcing air at relatively high pressure above ambient pressure and at high velocity through restricted orifice means into the combustion chamber for jet stirring and turbulent mixing,

low resistance air entry means into said combustion chamber and means for controlling said air entry means,

said combustion chamber refractory base portion as enumerated above,

flue gas propagation delay channel means bounded by refractory material for maintaining a high temperature environment, for directing flue gas away from the base of the combustion chamber, and for increased retention time of the flue gas and forced air mixture in the high temperature environment for completion of combustion chemical reactions prior to heat extraction from the flue gas,

refractory insulated manifold means for receiving the hot end products of combustion and for distribution of the hot gases over heat exchange means;

heat exchange means coupled to said refractory manifold and refractory furnace sequence output downstream from the delay channel means for recovering energy from the hot gaseous end products of combustion;

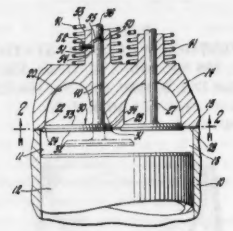
and means for inducing draft and establishing a low pressure gradient in the furnace sequence.

4,309,966

ECCENTRIC, OSCILLATING INTAKE VALVE

Edward D. Klomp, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 20, 1980, Ser. No. 132,102
Int. Cl.³ F01L *1/32*
U.S. Cl. 123—90.28 **3 Claims**



1. A valve controlled induction system for supplying an induction charge into the combustion chamber of an internal combustion engine, the combustion chamber being defined in part by a cylinder of the engine and by a piston reciprocable therein; said valve control induction system including a cylinder head having an induction passage therein terminating at an annular beveled valve seat defining an inlet port to the combustion chamber on the combustion side of said cylinder head and closely adjacent to the internal bore wall of the cylinder; a through stem guide bore in said cylinder head, the axis of said stem guide bore being offset a predetermined distance relative to the axis of said inlet port; an intake valve having a valve stem and a valve head, said valve head being constituted as a body of revolution about an axis, said valve head having a valve seating portion adjacent to one side thereof, said valve stem extending upward from said one side of said valve head with the axis of said valve stem offset relative to the axis of said valve head a distance corresponding to the offset axis of said stem guide bore relative to said axis of said inlet port, said valve stem being substantially simultaneously rotatably and reciprocably journaled in said stem guide bore with one end thereof extending above said cylinder head for actuation thereof; and, pivot drive means operatively associated with

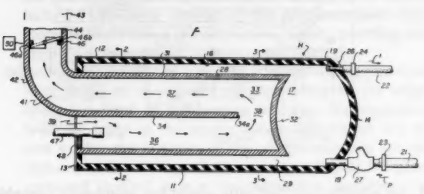
said cylinder head and said valve stem to effect oscillating movement of said valve stem and therefore of said valve head as said intake valve is moved between a closed position and an open position relative to the said valve seat via both pivoting and longitudinal spacing thereto upon reciprocation of said valve stem.

4,309,967

VARIATION OF ENGINE COOLANT HEATER

Edward S. Southard, 1101 W. Pine St., Lodi, Calif. 95240

Filed Jan. 11, 1980, Ser. No. 111,345
Int. Cl.³ F02N 17/06
U.S. Cl. 123—179 H **8 Claims**



1. A heating device for an internal combustion engine having an intake manifold and a block adapted for circulation of a liquid coolant therein comprising, in combination, a tank having an interior and a liquid inlet and a liquid outlet communicating with said interior, conduit means for connecting said tank inlet and outlet to said engine block for circulation of liquid coolant between said tank and said block, an enclosure having an interior disposed within said tank in sealed relationship therewith, said enclosure being arranged in spaced relationship with said tank to define a liquid chamber substantially surrounding said enclosure in heat transfer relationship therewith, an air inlet in said enclosure for introducing outside air into said enclosure interior and an air outlet for discharging air from said enclosure interior, means for heating the air introduced into said enclosure interior whereby heat is transferred from heated air flowing in said enclosure to said liquid in said liquid chamber thereby supplying heated coolant to said engine block, duct means for connecting said enclosure air outlet to said intake manifold to heat said intake manifold with said heated air from said enclosure, including a valve in said duct means, movable between a closed position and an open position, said valve being normally maintained in the open position during the operation of said heating device and means responsive to the starting of said internal combustion engine for moving said valve into said closed position said duct means and said valve being arranged so that when said valve is in a closed position in said duct means communication thereof with said intake manifold is completely interrupted, said valve entirely closing said duct.

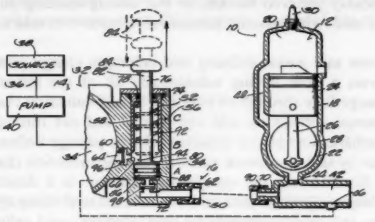
4,309,968

FUEL PRIMER AND ENRICHMENT SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Chester G. DuBois, Zion, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 25, 1979, Ser. No. 60,287
Int. Cl.³ F02M 1/16
U.S. Cl. 123—187.5 R **23 Claims**

1. An engine comprising a combustion chamber, first fuel delivery means communicating with said combustion chamber and adapted for connection with a fuel source, said first fuel delivery means being operative for introducing fuel from the source into said combustion chamber, second fuel delivery means communicating with said combustion chamber and adapted for connection with a fuel source, said second fuel delivery means being operative for introducing fuel into said combustion chamber in addition to the fuel introduced by said first fuel delivery means and including first fuel pumping means for pumping fuel through said second fuel delivery means to said combustion engine, and means movable independently of said first fuel pumping means and located in said second fuel delivery means for controlling the introduction of fuel into said combustion chamber by said second fuel delivery



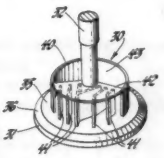
means during operation of said first fuel pumping means and for pumping fuel through said second fuel delivery means to said combustion chamber in response to movement of said independently movable means in said second fuel delivery means.

4,309,969

INDUCTION SYSTEM WITH HIGH-SWIRL INTAKE VALVE

William R. Matthes, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 17, 1980, Ser. No. 130,843
Int. Cl.³ F01L 3//06
U.S. Cl. 123—188 VA **3 Claims**



1. An induction system for an engine of the type having a cylinder block with at least one cylinder therein, a piston reciprocable in the cylinder, and a cylinder head partly closing one end of the cylinder whereby to define with the cylinder and the piston a combustion chamber; said induction system including means in the cylinder head defining an intake passage having an internal straight cylindrical wall that terminates at an annular conical valve seat whereby to define an intake port to the combustion chamber, a valve stem guide bore in said cylinder head concentric with said conical valve seat; a swirl inducing poppet valve operatively associated with the cylinder head to control flow of an induction charge through said intake passage into the combustion chamber; said swirl inducing poppet valve including a head constituting a body of revolution about an axis and having a valve back on one side thereof with an annular valve seating portion thereon for seating engagement with said conical valve seat; a valve stem integral with and upstanding concentrically from said valve back reciprocably journaled in said valve stem guide bore; and means associated with said valve back to define therwith a passage for an induction charge, said valve back means including a plurality of spaced apart directional vanes upstanding from said valve back over approximately one half of said valve back with each of said directional vanes extending radially inward a predetermined distance from said valve seating portion, a semi-circular disc fixed to one side edge of said directional vanes in spaced apart parallel relationship to said valve

back, and a segment of a cylindrical rim shroud upstanding from said valve back and connected at opposite ends to opposite radial extending edge ends of said semi-circular disc, the effective outside diameter of said valve back means being less than the inside diameter of said internal straight cylindrical wall of said intake port whereby said valve back means is reciprocably received therein, so that during opening movement of said swirl inducing poppet valve relative to said valve seat,

wherein said means defining said induction charge passage forms a flow having substantially all of the induction charge flow through an inlet end of said induction charge passage defined by said rim shroud and out through a discharge end of said induction charge passage defined in part by said directional vanes so that the induction charge is directed into the combustion chamber in a direction substantially tangential to the cylindrical wall of the cylinder; and, anti-rotation means associated with said cylinder head and said valve stem to prevent rotation of said swirl inducing poppet valve.

4,309,970

INTERNAL COMBUSTION ENGINE WITH AGGREGATE UNITS ARRANGED IN AN AUTOMOTIVE VEHICLE

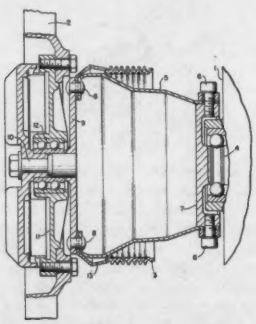
Joachim H. Sorsche, Stuttgart; Erich Ableitner, Remseck; Ernst Gobien, Weinstadt, and Manfred Minning, Esslingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed May 10, 1979, Ser. No. 37,772

Claims priority, application Fed. Rep. of Germany, May 10, 1978, 2820338

Int. Cl.[3] **F02B** *77/08;* **F02P** *7/02*

U.S. Cl. 123—198 D **11 Claims**



1. An internal combustion engine arranged in one of a front engine compartment and a rear engine compartment of a motor vehicle, the internal combustion engine including at least one auxiliary driven unit extending from the engine in one of two positions, toward a front of the motor vehicle when the engine is arranged in the front engine compartment and in the other of said positions toward a rear of the vehicle beyond the engine when the engine is arranged in the rear engine compartment, characterized in that means are provided for mounting the at least one auxiliary driven unit on the internal combustion engine, said means being constructed to configurationally shift axially between first and second relatively rigid configurations in response to collision imposed forces in a manner absorbing impact energy by at least one of the auxiliary driven unit and the mounting means through at least one of deformation work, an overcoming of a frictional resistance, and a displacement of a viscous substance against a resistance.

4,309,971

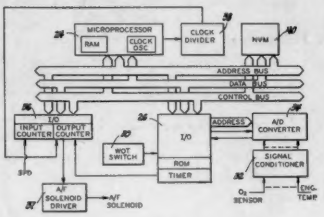
ADAPTIVE AIR/FUEL RATIO CONTROLLER FOR INTERNAL COMBUSTION ENGINE

Alan F. Chiesa, Yale; David G. Evans, Rochester; James R. Norford, and John A. Zahorchak, both of Warren, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1980, Ser. No. 142,331

Int. Cl.[3] **F02B** *3/00*

U.S. Cl. 123—480 **3 Claims**



1. An adaptive air/fuel ratio controller alternately operable in closed loop or open loop modes for an internal combustion engine having supply means to supply a mixture of fuel and air to the engine and a sensor providing a sensor signal in response to the air/fuel ratio of the mixture supplied to the engine, the means to supply a mixture of air and fuel being characterized by the variations in the air/fuel ratio of the mixture supplied thereby in response to varying engine operating parameters including engine temperature, the controller including, in combination:

first and second memories each having numbers stored at locations addressable in accordance with an engine operating point determimed by at least the value of engine load;

means effective during the closed loop operating mode of the air/fuel ratio controller (a) to adjust the supply means in accord with the number stored in the first memory at the location addressed by the engine operating point at least when the engine first operates at said operating point and, at least at some times, in accord with the sensor signal in a direction to establish a predetermined closed loop air/fuel ratio, (b) to adjust the number in the first memory at the address corresponding to the engine operating point in a direction to cause correspondence with the value of the supply means adjustment and at a rate in accord with a first time constant, the first time constant having a value so that the numbers in the first memory are each updated substantially to the value producing the predetermined closed loop air/fuel ratio at the respective engine operating point during varying engine operating parameters and (c) to adjust the number in the second memory at the address corresponding to the engine operating point in a direction to cause correspondence with the value of the supply means adjustment and at a rate in accord with a second time constant, the second time constant having a value greater than the value of the first time constant so that the numbers in the second memory are each updated to the average of the values producing the predetermined air/fuel ratio at the respective operating point during varying engine operating parameters; and

means effective during the open loop operating mode of the air/fuel ratio controller to adjust the supply means by an amount determined at least in part by the number stored in the second memory at the location addressed by the engine operating point.

3. The method of controlling the air/fuel ratio in closed loop or open loop modes in an internal combustion engine having supply means to supply a mixture of fuel and air to the engine and a sensor providing a sensor signal in response to the air/f-

uel ratio of the mixture supplied to the engine, the method of including the steps of:

determining the engine operating point;

adjusting the supply means during the closed loop mode in accord with a number stored in a first memory at a location addressed by the engine operating point at least when the engine first operates at said operating point and, at least at some times, in accord with the sensor signal in a direction to establish a predetermined closed loop air/fuel ratio;

adjusting the number in the first memory during the closed loop mode at a location addressed by the engine operating point in a direction to cause correspondence with the value of the supply means adjustment and at a rate so that the numbers in the first memory are each updated substantially to the value producing the predetermined closed loop air/fuel ratio at the respective engine operating point during varying engine operating parameters;

adjusting the number in a second memory during the closed loop mode at an address corresponding to the engine operating point in a direction to cause correspondence with the value of the supply means adjustment and at a rate so that the numbers in the second memory are each updated to the average of the values producing the predetermined air/fuel ratio at the respective operating point during varying engine operating parameters; and

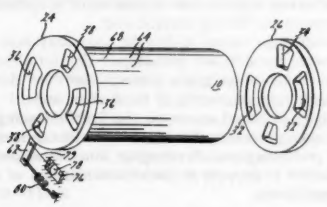
adjusting the supply means during the open loop mode by an amount determined at least in part by a number stored in the second memory at a location addressed by the engine operating point.

4,309,972

CENTRIFUGAL ADVANCED SYSTEM FOR WAVE COMPRESSION SUPERCHARGER

James K. Vallance, Northville, and Jeffrey A. Cook, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 3, 1979, Ser. No. 99,245
Int. Cl.³ F04F *11/00*
U.S. Cl. 123—559 **3 Claims**



1. A wave compression supercharger for compressing air supplied to an engine comprising:

a rotor mounted for rotation about its axis, including a hub and axially disposed cells formed about the periphery of the hub;

a shroud surrounding said rotor;

an exhaust gas duct having a low pressure exhaust gas passage and a high pressure exhaust gas passage communicating with the exhaust gas side of the engine;

an air duct having a high pressure air outlet passage communicating with the air intake side of the engine and a low pressure air inlet passage;

a first port plate disposed between said rotor and said air duct having formed therein a low pressure air inlet port and a high pressure air outlet port communicating respectively with a low pressure passage and a high pressure passage of the air duct;

a second port plate disposed between said rotor and said exhaust gas duct having formed therein a low pressure gas outlet port and a high pressure gas inlet port communicating respectively with the low pressure passage and the high pressure passage exhaust gas duct, at least one of said port plates having a cam follower surface formed thereon;

means providing a cam surface mounted for axial movement parallel to the axis of said rotor and engaging the cam surface of said port plate; and

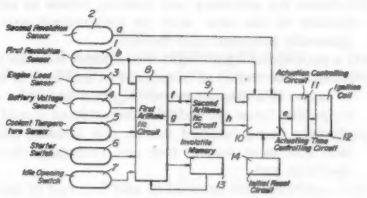
means for moving the cam surface axially into engagment with the cam follower surface thereby causing the port plate to rotate about the longitudinal axis of the rotor.

4,309,973

ELECTRONICALLY CONTROLLED IGNITION DEVICE FOR COMBUSTION ENGINE

Hideyuki Tamura, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Apr. 4, 1980, Ser. No. 137,415
Claims priority, application Japan, Apr. 11, 1979, 54-42948
Int. Cl.³ F02P *1/00*
U.S. Cl. 123—609 **9 Claims**



1. An electronically controlled ignition device for a combustion engine, comprising

a first revolution sensor for generating an angular pulsive signal with response to an angle of revolution of the combustion engine,

a second revolution sensor for generating a number of reference pulsive signals during every one revolution of the combustion engine which number corresponds to a number of cylinders of the combustion engine,

a first arithmetic circuit for calculating an ignition timing and an actuating angle of revolution for an ignition coil with response to a running condition of the combustion engine,

a second arithmetic circuit for calculating an unactuated angle of revolution for the ignition coil by referring to said ignition timing and said actuating angle of revolution for the ignition coil calculated in said first arithmetic circuit,

an actuating time controlling circuit for counting firstly said angular pulsive signals generated after the immediately preceding ignition timing, and starting the actuation for the ignition coil at a timing at which a value resulted by the first count of said angular pulsive signals concides with said unactuated angle of revolution calculated in said second arithmetic circuit, and counting secondly said angular pulsive signals generated after said reference pulsive signal is applied to said actuating time controlling circuit, and further generating an output signal for cutting off the actuation for the ignition coil at a timing at which a value resulted by the second count of said angular pulsive signals coincides with said ignition timing calculated in said first arithmetic circuit, and

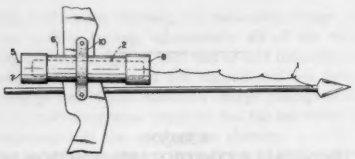
an actuation controlling circuit for controlling the actuation for the ignition coil according to said output signal generated in said actuating time controlling circuit.

4,309,974

GAME FINDER HUNTING BOW COMBINATION

James R. Carter, H-5 Deertrack Villas, Deerfield Plantation, Surfside, and Hope L. Willard, Rte. 2, Box 369, N. Myrtle Beach, both of S.C.

Filed Dec. 11, 1978, Ser. No. 968,124
Int. Cl.[3] F41B 5/00
U.S. Cl. 124—23 R 4 Claims



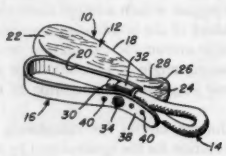
1. A game hunting combination comprising:
(a) an archery bow having a central section disposed between the ends of the bow;
(b) an elongated hollow tubular housing means closed at both ends, one of said closed ends being formed by a removable cap having a centrally positioned aperture therein;
(c) means for attaching said housing means to said central section of the bow with its longitudinal axis directed generally perpendicular thereto;
(d) a package of lightweight line wound, from an innermost wound free end to an outermost wound end, in a plurality of layers in a manner permitting said line to be unwound by pulling force applied to said innermost would end, said package being inserted within said housing means with said innermost wound free end extending through said aperture; and
(e) a captive arrow secured to said free end of the line.

4,309,975

ARCHERY BOWSTRING RELEASE

Anthony L. Altier, P.O. Box 286, Honesdale, Pa. 18431

Filed Jul. 26, 1979, Ser. No. 60,887
Int. Cl.[3] F41B 5/00
U.S. Cl. 124—35 A 3 Claims



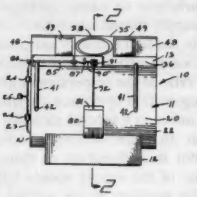
1. A bowstring release including an elongated rigid handle, said handle being receivable in the hand of a user and comprising a first edge adapted to seat in the palm of the user, an opposed second edge adapted to have the user's fingers wrap thereabout, an inner hand receivable end and an opposed projecting outer end, a string engaging loop, said loop having a central bight portion and an opposed end portion, means fixing the end portion of the loop to the handle with the loop projecting beyond the outer end of the handle a distance sufficient to engage about a bowstring and selectively position the loop about said outer end to engage the bight portion of the loop with the first edge of said handle adjacent the outer end of the handle, said first edge of the handle including a recess defined therein and configured to receive the bight portion of said loop, and a smoothly contoured shoulder on said first edge immediately outward of said recess and adjacent said outer end of the handle for a selective retention of the bight portion of the loop therebehind and within the recess upon application of retaining pressure on said loop generally perpendicular to the recess, said loop being of a width greater than that of the outer end of the handle to enable projection of the outer end of the handle through said loop.

4,309,976

WOOD HEATER

Mark E. Starr, P.O. Box 89, Coeur d'Alene, Id. 83814

Filed Mar. 17, 1980, Ser. No. 130,742
Int. Cl.[3] F24C 1/00; F24B 7/00
U.S. Cl. 126—61 8 Claims



1. A wood heater, comprising:
a base;
an elongated horizontal firebox on the base having a hollow interior defined by longitudinal side walls joined by transverse end walls;
open first and second slots formed through the side walls adjacent the transverse end walls and opening into the hollow firebox interior;
a secondary heat chamber affixed to the firebox along the longitudinal side walls and covering the slot so the hollow interior of the firebox is separated from the secondary heat chamber by the side walls and communicates with the interior of the secondary heat chamber through the slots;
a flue adapter ring mounted to the secondary heat chamber between the slots for receiving combustion gases therefrom and for directing the combustion gases away from the heater;
a door on one of the end walls adapted to be opened to allow access to the firebox interior; and
heat exchanger means within the secondary heat chamber between the slots and flue adapter ring for directing heat from combustion gases passing from the slots to the adapter ring, outwardly of the firebox; and
secondary air bleed means on the firebox leading into the secondary heat chamber adjacent the first and second slots for preheating and directing air into the secondary heat chamber to support secondary combustion of unburned gases therein.

4,309,977

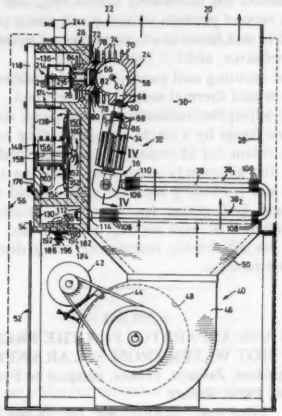
PULSE COMBUSTION APPARATUS

John A. Kitchen, R.R. #3, Hastings, Ontario, Canada (K0L 1Y0)

Filed May 12, 1980, Ser. No. 148,624
Int. Cl.[3] F24H 3/00; F23C 11/04
U.S. Cl. 126—99 A 12 Claims

1. A pulse combustion air furnace comprising:
means defining a passageway through which air to be heated can flow;
a combustion chamber having a fuel charge inlet and an exhaust gas outlet;
means supporting the combustion chamber in said air flow passageway;
means associated with said combustion chamber inlet for admitting successive fuel charges to said chamber;
means operable to initiate combustion in said chamber;
an exhaust system disposed in said air passageway and comprising a primary exhaust pipe having first and second ends and coupled at its first end to said exhaust gas outlet

of the combustion chamber; a manifold having an inlet to which said second end of the primary exhaust pipe is coupled and a plurality of outlets; and a plurality of heat exchange pipes each having an inlet coupled to one of said manifold outlets and an outlet, said pipes extending from the manifold across said air passageway so that the pipes are disposed in the path of air flowing through said passageway in use; and,



means defining a muffler chamber to which said second ends of the heat exchange pipes are coupled;

said primary exhaust pipe, manifold and heat exchange pipes forming a resonant system with said combustion chamber so that the ignition of successive fuel charges in said combustion chamber causes pressure waves to oscillate throughout said exhaust system including the heat exchange pipes for promoting transfer of heat from said pipes to air flowing through said passageway in use.

4,309,978

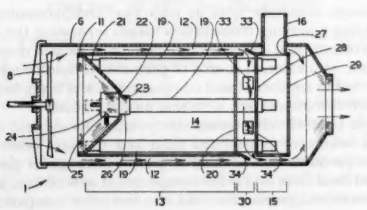
FORCED AIR HEATER

Charles R. Hensiek, Overland; Paul A. Mutchler, University City, and Rayford W. Timms, St. Louis, all of Mo., assignors to American Air Filter Company, Inc., Louisville, Ky.

Filed May 16, 1980, Ser. No. 150,613

Int. Cl.³ F24H *3/02, 3/00, 1/00*

U.S. Cl. 126—110 B **16 Claims**



2. A forced air heater, comprising:

an outer casing;

an axial flow fan in said casing for forcing venting air through the casing;

a combustion drum within the casing downstream from said fan;

said drum having a closed downstream end and an upstream end wall enclosing the upstream end of the drum to define a combustion chamber within the drum; and

said end wall being of a generally frustoconic configuration including a central annular rim portion defining an opening through said wall;

burner means supported in said opening by said rim portion adapted to deliver an axially directed jet of combustion products into the chamber toward the downstream end of the drum;

a flue gas header aligned within the casing downstream from said drum;

stack means venting the interior of said header to the atmosphere;

duct means connected with said header opening into the combustion chamber through the upstream end of the drum to provide separate fluid communication between the chamber and the interior of the header; and

spacing means supporting said drum and header in generally concentrically spaced relation with said casing to provide at least one passage for directing venting air through the heater.

4,309,979

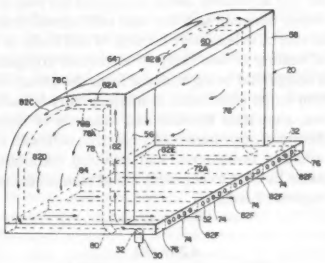
FORCED AIRFLOW FIREPLACE UNIT

Delton L. Burch, 309 W. Blanchard St., Henrietta, Tex. 76365

Filed Oct. 30, 1978, Ser. No. 955,576

Int. Cl.³ F24B *7/00*

U.S. Cl. 126—131 **14 Claims**



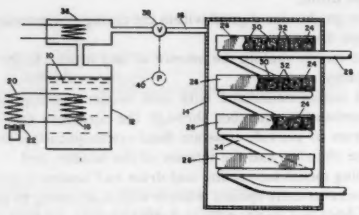
1. A forced airflow fireplace unit comprising an open front firebox shell, said shell including hollow interconnected bottom, side, top and rear wall members collectively forming a continuous hollow air heating chamber, said bottom member having upper and lower surfaces, said upper surface serving as a fire support surface, a plurality of spaced apart vanes within said bottom member extending from front to rear between said upper and lower surfaces defining a plurality of side by side airflow channels extending from the front to the rear of the bottom member, an air blower operatively connected into a said side wall member for introducing air under pressure thereinto, means in said side wall member forming a substantially vertical flow channel therethrough, said channel being separate from the remainder of said side wall member and proximate the front end thereof for directing the flow of air from said air blower upwardly through said vertical channel in said side wall member and into, across and through said top member, said airflow continuing downwardly through said rear member into the rear of said bottom member and forwardly through said side by side airflow channels in said bottom member under said fire support surface, and apertures defined in the front of said bottom member for discharging heated air from said bottom member.

4,309,980

CLOSED VAPORIZATION HEAT TRANSFER SYSTEM

Richard A. McCormack, La Jolla, and Eric A. Jensen, Del Mar, both of Calif., assignors to Thermal Energy Storage, Inc., San Diego, Calif.

Filed Mar. 7, 1980, Ser. No. 128,128
Int. Cl.³ F24J 1/00
U.S. Cl. 126—263 17 Claims



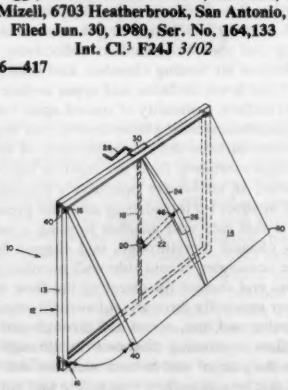
1. A closed vaporization heat transfer system for withdrawing heat at a lower temperature and discharging it at a higher temperature comprising a first chamber, a body of solid aluminum compound in said first chamber, heat transfer means disposed to receive heat from or to supply heat to said solid aluminum compound a second chamber, a body of water in said second chamber, means to maintain said system under reduced pressure for removing gases and vapors other than water vapor from the system, heat transfer means disposed to supply heat to or to receive heat from said body of water, a conduit for passage of vapors of said water from one container to the other and adjustable means to control the rate of passage of water vapor between said first and said second chambers to control the rate of evaporative cooling of said body of water or the rate of heating of said body of aluminum compound, said aluminum compound being selected from the group consisting of aluminum oxide hydroxide, aluminum trihydroxide, aluminum sulfate, aluminum fluoride and mixtures of these physically or chemically exothermically reactive with said vapors to form an addition compound, said addition compound being decomposable by heat to regenerate said aluminum compound and said vapors of water.

4,309,981

SOLAR WINDOW SYSTEM

James D. Briggs, Star Rte. Box 574-637, Kerrville, Tex. 78028, and Ben Mizell, 6703 Heatherbrook, San Antonio, Tex. 78238

Filed Jun. 30, 1980, Ser. No. 164,133
Int. Cl.³ F24J 3/02
U.S. Cl. 126—417 12 Claims



1. A solar window system capable of functioning as a shade awning, a solar reflector and a thermal-security shutter, said window comprising:

a window frame of predetermined dimensions;

a single mutli-purpose, insulated panel of similar dimensions, said panel being reflective on both sides;

first means for alternately connecting said panel pivotally, a first position of said panel being pivotally connected to said frame at a top thereof to function as said shade awning;

second means for alternately connecting said panel pivotally, a second position of said panel being pivotally connected to said frame at a bottom thereof to function as said solar reflector; and

means for securing said panel in a third position against said frame as said thermal-security shutter; and

means to adjust the inclination of said panel relative to said window frame by a single set of actuating mechanisms;

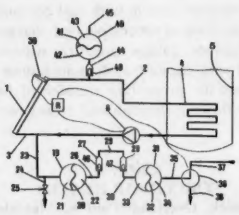
said first means for alternately connecting and said second means for alternately connecting forming said securing means and providing separate parts of said means to adjust, said first means for alternately connecting being disconnected in said second position and said second means for alternately connecting being disconnected in said first position.

4,309,982

PROCESS AND APPARATUS FOR THE PREPARATION OF HOT WATER FROM SOLAR ENERGY

Bernard Oquidam, Jaillans, France, assignor to Pechiney Ugine Kuhlmann, Paris, France

Filed Apr. 10, 1979, Ser. No. 28,648
Claims priority, application France, Apr. 11, 1978, 78 11430
Int. Cl.³ F24J 3/02; E03B 7/10; F24D 3/10
U.S. Cl. 126—420 9 Claims



2. A system for protection against freezing of heat transfer fluid in a solar heating system comprising:

a solar collector and a heat exchanger interconnected by a closed circuit containing a first fluid;

an external source of pressurized fluid;

a storage container with at least two compartments and having a moving transmission means separating the compartments, said closed circuit including one said compartment, said external source of pressurized fluid being connected to another of said compartments and being isolated from communication with said closed circuit;

remote control valve means interposed between said external source of pressurized fluid and the said other said compartment and adapted to permit drainage of pressurized fluid from said other compartment as well as to allow flow of said pressurized fluid into said other compartment; and

temperature sensing means adjacent said solar collector and exposed to the external atmosphere and connected to said remote control valve means for actuating the same to drain pressurized fluid from said other compartment when the sensed temperature approaches the freezing point of the first fluid, whereby said moving transmission means will move to increase the capacity of the one said compartment to receive therein all of the fluid in the closed

circuit, and to actuate the valve means when the sensed temperature is at a safe operating level to admit pressurized fluid into the other said compartment, displacing said moving transmission means to force some of the first fluid from said one compartment back into the closed circuit, filling the same.

4,309,983

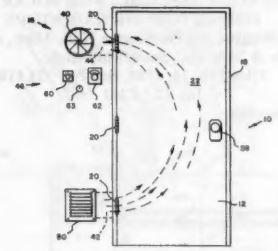
SOLAR HEAT COLLECTOR

Robert Brill, 815 Nile, Golden, Colo. 80401

Filed Jul. 27, 1979, Ser. No. 61,318

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—422 **7 Claims**



1. A solar heat collector mounted in an exterior doorway of a dwelling, said collector comprising;

a heat absorbant inner door having a heat absorbant outer side for absorbing solar radiation which impinges thereon and hingedly connected to said doorway;

a transparent outer door mounted parallel to and spaced from the inner door and hingedly connected to said doorway such that a closed chamber is formed between the inner and outer door; and

circulation for circulating air through the closed chamber for picking up heat from the heat absorbant inner door including an air intake means coupled to the chamber between the doors for providing air to the chamber from said dwelling, an air outlet means connecting the chamber with the interior of the dwelling, and an exhaust fan coupled to the chamber for drawing air flow from the air intake through the chamber for heating and then into the dwelling.

4,309,984

SOLAR ENERGY COLLECTION SYSTEM

Leo R. Dorbeck, Campbellville, Canada, assignor to Canadian Sun Systems Ltd., Campbellville, Canada

Filed Dec. 10, 1979, Ser. No. 101,808

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—422 **25 Claims**

16. A solar collector, comprising:

an evacuated housing,

a focussing solar reflector located within the housing and having a reflecting surface receiving solar energy thereon through a transparent element of said housing and focussing the same from said surface to a focus in said housing;

an absorber tube located substantially at said focus of said reflector surface to absorb solar energy concentrated thereon at said focus and adapted to convey fluid to be heated through said collector;

said focussing reflector having a concentration ratio of about 1 to about 50, said concentration ratio being defined as the ratio of the maximum transverse width of said reflector to the outer circumference of the absorber tube;

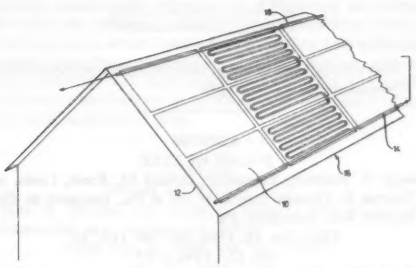
said reflecting surface having mirror image cross-sectional shaped portions on either side of a vertical axis of the reflector, each having a length required to ensure that no less than about 75% of the maximum efficiency of the collector is realized;

said maximum efficiency being provided by the shape of said reflecting surface required to ensure that all incident rays received into said collector through said transparent element and within the acceptance angle θ subtended to said vertical axis and determined by the equation:

$$C = 1/\sin\theta$$

where C is the concentration ratio and θ is the acceptance angle, are concentrated on said absorber tube at said focus;

heat conductive means located within said housing supporting said absorber tube and normally positioning said absorber tube at said focus, said heat conductive means sensing the temperature of said absorber tube, and



heat sensitive means located within said enclosure movable between first and second positions corresponding to focussed and non-focussed positions of said absorber tube with reference to said reflector surface,

said heat sensitive means being mechanically interconnected with said heat conductive means and in heat conducting relationship therewith to effect movement of said absorber tube through said mechanical interconnection with said heat conductive means from the focussed position to the non-focussed position thereof in response to sensed absorber tube temperatures exceeding a predetermined value.

4,309,985

SOLAR COLLECTOR WITH LENS ARRAY

Armin Bohg, Neuweiler, and Marian Briska, Boeblingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 59,017, Jul. 19, 1979, Pat. No. 4,267,823. This application Jan. 12, 1981, Ser. No. 224,585

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842400

Int. Cl.³ F24J *3/02*

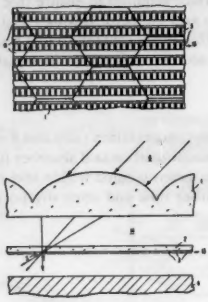
U.S. Cl. 126—422 **2 Claims**

1. A solar collector comprising in combination an absorber member, a substrate member and a lens member each being essentially planar and mounted, having the major dimension thereof parallel;

said lens member having a plurality of light-focusing shapes along said major dimension;

said substrate member having a light transmission control coating, said substrate member being positioned so that said coating is at the focal length of said light-focusing

shapes of said lens member and said coating having deforming properties capable of permitting light transmis-



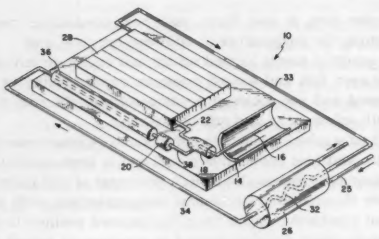
sion through said coating, said deforming properties being responsive to focused light.

4,309,986

SOLAR HEATER

George Y. Eastman, Lancaster; Donald M. Ernst, Leola, and Warren E. Thomas, Lancaster, all of Pa., assignors to Thermacore, Inc., Lancaster, Pa.

Filed Jan. 21, 1980, Ser. No. 113,773
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—433 8 Claims



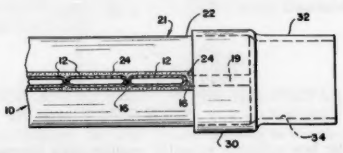
1. A self-pumping solar heater for liquids comprising:
a reservoir containing a heat transfer liquid;
a check valve connected to the outlet of the reservoir;
a vapor generator pump with inlet connected to the check valve, located at a lower liquid head than the reservoir, and capable of pumping the heat transfer liquid by vapor action;
a first solar collector, capable of producing temperatures high enough to vaporize the heat transfer liquid;
a heat pipe included in said first solar collector and connected between the first solar collector and the vapor generator pump and capable of conducting heat from the first solar collector to the vapor generator pump for maintaining temperatures at the vapor generator pump which vaporize the heat transfer fluid and permitting independent and remote location of the first solar collector from the vapor generator pump;
a second solar collector connected in series with the vapor generator pump and the reservoir;
a main heat exchanger connected in series with the second solar collector, the reservoir, and the vapor generator pump, and constructed to transfer heat to a heat load; and
return flow means connected in series with the reservoir, the second solar collector, the vapor generator pump, and the main heat exchanger for returning heat transfer liquid from the main heat exchanger to the reservoir to be reheated.

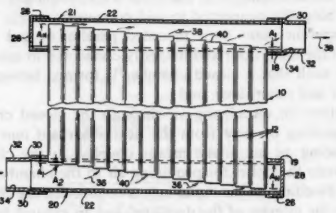
4,309,987

FLUID FLOW ASSEMBLY FOR SOLAR HEAT COLLECTORS OR RADIATORS

Clifford H. Higgins, Jr., Farmington Hills, Mich., assignor to H & H Tube & Mfg. Co., Southfield, Mich.

Filed Feb. 14, 1980, Ser. No. 121,418
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—448 16 Claims





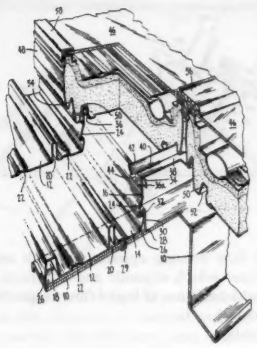
1. A solar heat energy absorber panel comprising an inlet header and an outlet header, and a plurality of elongated tubular members placing said headers in fluid communication, each of said elongated tubular members being in the form of a substantially flat tube having a pair of relatively wide sidewalls disposed substantially parallel and integrally interconnected by a pair of opposite relatively narrow sidewalls, said tubular members being disposed side by side with their relatively wide sidewalls coplanar and each of their relatively narrow sidewalls contiguous with the relatively narrow sidewall of an adjoining tubular member, wherein said headers have each a longitudinal slot formed radially through a wall, the end of each of said elongated tubular members is affixed through said slot and has an end portion projecting into the interior of each of said headers, and said projecting end portions have a length disposed in said inlet header progressively increasing in the direction of fluid flow through said inlet header and have a length disposed in said outlet header progressively decreasing in the direction of fluid flow through said outlet header, wherein said headers are each of a length of pipe of constant diameter from end to end and said slot extends from one end to the other of said length of pipe and each of said length of pipe has a plug affixed on one end and a connector fitting affixed on the other end, said plug and said connector having a wall portion secured over and obturating a corresponding portion of said slot extending between an edge tubular member and the end of said length of pipe.

4,309,988

ROOF ASSEMBLY

H. John Riley, Wembley, Australia, assignor to S. W. Hart & Co. Pty. Ltd., Welshpool, Australia

Filed Feb. 6, 1980, Ser. No. 118,950
Claims priority, application Australia, Apr. 27, 1979, PD 8555
Int. Cl.³ F24J *3/02*; E04D *13/00*
U.S. Cl. 126—450 **8 Claims**



1. A roof assembly mounted on a sloping roofing structure, comprising

(a) at least two parallel longitudinal flashing members extending down the slope of and mounted on the roofing structure, each longitudinal flashing member comprising an elongated base having an upstanding wall extending along each major side, and each upstanding wall having a resilient portion at its end remote from said base;

(b) a plurality of transversely extending U-shaped flashing members mounted parallel to one another and connected to adjacent longitudinal flashing members, said U-shaped flashing members being so mounted as to cause any water in them to flow into the longitudinal flashing members to which they are connected;

(c) at least one solar energy collector generally rectangular in horizontal section and having a downwardly facing groove formed in each of two longitudinal sides, a downwardly facing recess formed in each of two transverse sides and means for connection to pipes located above said downwardly facing grooves and recesses;

(d) said at least one solar energy collector being mounted on a pair of said longitudinal flashing members by engagement of each of said downwardly facing grooves with a resilient portion of a said wall of a respective longitudinal flashing member such that said solar energy collector is clipped in place in the said assembly;

(e) said at least one solar energy collector being mounted on a pair of said transverse U-shaped flashing members by engagement of each said downwardly facing recess with a leg of a respective U-shaped flashing member;

(f) the arrangement being such that said at least one solar energy collector and the associated longitudinal and transverse flashing members form a waterproof membrane, and means for connection to pipes of said solar energy collector are located above said waterproof membrane.

4,309,989

TOPICAL APPLICATION OF MEDICATION BY ULTRASOUND WITH COUPLING AGENT

Mostafa S. Fahim, Columbia, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Continuation of Ser. No. 656,143, Feb. 9, 1976, abandoned. This application Aug. 14, 1978, Ser. No. 933,205
The portion of the term of this patent subsequent to Nov. 12, 1998, has been disclaimed.
Int. Cl.³ A61K *33/02, 33/30*; A61M *37/00*; A61H *23/00*
U.S. Cl. 128—24 A **6 Claims**

1. In the treatment of Herpes Simplex lesions, a method for the selective localized intracellular administration of a medication including urea and a zinc compound in a coupling agent, the urea and zinc compound being present in an effective amount, which comprises applying said medication to the affected area and massaging said medication therein with an ultrasonic applicator coupled to an ultrasonic generator, said applicator continuously vibrating at a frequency of at least 1,000 KHZ and having an effective power level from about 1 watt per sq. cm to about 3 watts per sq. cm for a time sufficient to obtain intracellular penetration of said medication without causing undo cell wall deterioration whereby the zinc amplifies the mechanical effects of the ultrasonic vibrations and the urea acts as an antiviral agent.

4,309,990

FOAM MEDICAL CAST

William R. Brooks, and Irving C. Heinzel, both of 139 W. Commercial Ave., Addison, Ill. 60101

Filed Aug. 15, 1980, Ser. No. 178,567
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—90 **8 Claims**

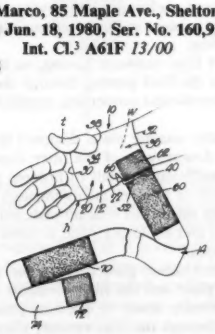
1. The method of making a foam medical cast comprising the steps of: providing a water-catalyzable polyurethane prepolymer composition under superatmospheric pressure, said composition including a blowing agent; providing an elongate bandage strip; dispensing a bead of said prepolymer composition onto said bandage strip inboard from the edges thereof to make a cast preform; allowing the dispensed prepolymer composition to expand and foam on said strip under ambient conditions; wrapping an undergarment on a human body part to be immobilized; moistening said wrapped undergarment with water; wrapping said cast preform over and about said moistened undergarment while said prepolymer composition is in a plastic state; shaping said preform to said human body part; spraying a mist of water droplets on the exterior of the shaped preform; and allowing the preform to cure to a rigid foam material.

4,309,991

WRIST BRACE

Alexander H. DeMarco, 85 Maple Ave., Shelton, Conn. 06484

Filed Jun. 18, 1980, Ser. No. 160,910
Int. Cl.³ A61F *13/00*
U.S. Cl. 128—165 **1 Claim**



1. A wrist brace, providing a normally flat tubular body of

flexible material having opposite side edges and being open at both ends and forming over successive first and second lengths thereof a sheath and a cuff, respectively, with said sheath being circumferentially closed except for a thumb aperture intermediate said first length and along one of said edges, and said sheath being of a width for fitted reception of a length of the palm of a human hand and with the thumb in register with said aperture on widthwise slipping the body with the cuff leading over the fingers and palm and onto the wrist of the hand, and said other side edge of said body along said cuff being slit open and spaced inwardly from said other side edge along said sheath, a stiffener externally secured to the backside of the sheath and cuff, and strap means on said cuff for winding around said body.

4,309,992

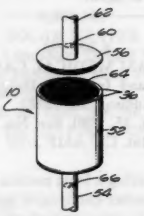
MICROBICIDAL FILTER

Michael J. Dodak, 116 Avenida Dolores, San Clemente, Calif. 92672, and Charles R. Whitlock, 10454 Gloria Ave., Granada Hills, Calif. 91344

Filed Jul. 11, 1980, Ser. No. 167,507

Int. Cl.[3] **B01D** *27/00*

U.S. Cl. 128—213 A **2 Claims**



1. A microorganism filter for use in removing living microorganisms from fluids to be introduced in vivo comprising:

a housing defining a tubular fluid flow passage having a tubular wall, an inlet end and an outlet end, the outlet end in fluid communication with a passage in vivo, said housing further including a fist end enclosure plate, and second end enclosure plate;

a first coupling at the inlet end forming a connecting means for connecting a source of fluid to the inlet end of the housing;

a second coupling at the outlet end forming a coupling means for connecting the outlet to an in vivo passage;

said first end enclosure plate having an opening placing the tubular passage in fluid communication with the first coupling;

said second end enclosure plate having an opening placing the tubular passage in fluid communication with the second coupling;

a plurality of filter elements having, on the surface thereof exposed to the fluid passing through the filter, a material having microbicidal properties, contained within the flow passage.

a porous outlet retainer plate, disposed in the flow path of the fluid, downstream of the filter elements, and having openings sufficiently small to prevent passage of any of the plurality of filter elements through the outlet end of the housing, said outlet retainer plate being displaced from the second end enclosure plate to form an outlet plenum therebetween;

a porous inlet retainer plate disposed between the first end enclosure plate and the filter elements and having openings sufficiently small to prevent passage of the filter elements through the inlet retainer plate;

a tubular auxiliary filter disposed between the end of the second coupling and the external end of the in vivo passage; and

the tubular auxiliary filter containing a plurality of the filter elements.

4,309,993

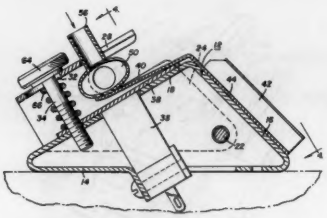
LIQUID FLOW SENSING APPARATUS

Richard I. Brown, Northbrook, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 6, 1980, Ser. No. 127,554

Int. Cl.[3] **A61M** *5/00;* **G01L** *9/10;* **H01H** *35/40;* **F04B** *49/06*

U.S. Cl. 128—214 E **9 Claims**



1. Liquid flow sensing apparatus which utilizes a flexible pressure pillow which expands and contracts in response to liquid flow and cessation of liquid flow respectively, said apparatus comprising:

a base member;

an eddy current proximity sensor carried by said base member;

a flexible metallic spring member carried by said base member for movement toward and away from said eddy current proximity sensor, said spring member being normally biased away from said eddy current proximity sensor;

a housing pivotally mounted on said base and including means for supporting the pressure pillow with one side of the pillow in contact with said flexible spring member, said support means including platen means contacting the opposite side of the pressure pillow for exerting a measurable force against the opposite pillow side in opposition to the biasing force of said flexible spring member so that, in response to the expansion and contraction of the pressure pillow, only said flexible spring member moves relative to said eddy current proximity sensor; and

calibration means controlling the pivotal movement of said housing relative to said base for adjusting the magnitude of said measurable force exerted by said platen means against the pressure pillow.

4,309,994

CARDIOVASCULAR CANNULA

Ronald P. Grunwald, W. 801 - 5th Ave., Spokane, Wash. 99204

Filed Feb. 25, 1980, Ser. No. 124,335

Int. Cl.[3] **A61M** *5/00, 25/00*

U.S. Cl. 128—214 R **6 Claims**

1. A venous drainage cannula assembly for insertion into the superior and inferior vena cavae through a single incision in the right atrium, comprising:

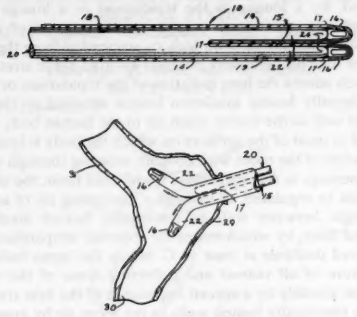
an elongated resilient tube including a hollow body leading from an open outward end along a longitudinal axis, inwardly to an integral bifurcated tube end, the bifurcations forming two branches joining integrally with the hollow body at a crotch section of the tube;

wherein the branches extend from the crotch to free open ends, with the length of the branches from the crotch to the free ends being sufficient to allow positioning of the free open ends within the superior and inferior vena cavae with the crotch situated within the right atrium and the incision edges engaging the hollow body toward the open outward tube end from the crotch;

wherein the branches normally diverge from the crotch to

the free tube ends, forming a "Y" configuration with the hollow tube body; and

rigid obturator means having an elongated shaft slidably receivable within the length of the resilient tube and with straight extensions integral and coextensive with the shaft having a rounded end to be (a) received within the tube branches so the tube branches may be straightened by the



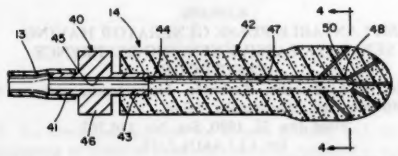
rounded extension ends to extend parallel to the axis of the tube body as the obturator is inserted and moved relative to the tube toward the bifurcated end, and (b) allow the tube branches to spread back against the rounded extension ends to their normal diverging positions, all within the right atrium, thereby avoiding trauma to tissues at the incision upon insertion and withdrawal of the cannula.

4,309,995

VAGINAL IRRIGATION APPARATUS

Susan M. Sacco, 2316 Leyden Ave., River Grove, Ill. 60171

Filed Jan. 28, 1980, Ser. No. 115,909
Int. Cl.³ A61M *3/00*
U.S. Cl. 128—239 **14 Claims**



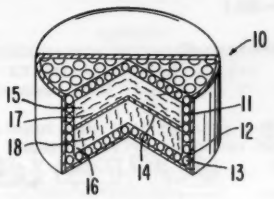
1. A therapeutic irrigating apparatus for delivering medicant to the user through a rectally or vaginally implanted probe, comprising; a supply container for medicant, a transfer tube connected to and communicating with the supply container, and a disposable probe connected to the transfer tube for insertion into the patient, said probe being constructed of a semi-flexible or substantially rigid foam material that is unsupported throughout a major portion of its length and open cellular in structure to transfer medicant from the transfer tube to the patient, said foam having sufficent rigidity so that the unsupported probe may be rectally or vaginally inserted manually without any additional implements.

4,309,996

SYSTEM WITH MICROPOROUS RELEASING DIFFUSOR

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Apr. 28, 1980, Ser. No. 144,210
Int. Cl.³ A61M *7/00*
U.S. Cl. 128—260 **19 Claims**



1. A system for the controlled delivery of a beneficial agent to an environment of use, the system comprising:

a. a wall having a plurality of micropaths through the wall, the wall surrounding and forming:

b. an internal compartment;

c. a flexible partition in the compartment joined to the wall, said partition forming a first internal space and a second internal space within the compartment;

d. a beneficial agent in the first space; and,

e. means in the second space for increasing the volume of said second space, which means are a member selected from the group consisting essentially of an osmotically effective solute and a swellable lightly cross-linked polymer.

4,309,997

CONTRACEPTIVE AND/OR ANTIVENEREAL DISEASE TAMPON

Jack W. Donald, Suite C, 10780 Pebble Hills, El Paso, Tex. 79935

Continuation-in-part of Ser. No. 76,164, Sep. 17, 1978, which is a continuation of Ser. No. 888,578, Jun. 6, 1978, Pat. No. 4,186,742. This application Mar. 24, 1980, Ser. No. 132,843
The portion of the term of this patent subsequent to Feb. 5, 1997, has been disclaimed.
Int. Cl.³ A61F *13/20*
U.S. Cl. 128—270 **5 Claims**

1. A moist medicated vaginal tampon for contraceptive and venereal disease control comprising a soft, porous foam ball of substantially spherical configuration in the uncompressed state and of a size and compressibility to fit snugly within the vagina of a human female to cover the cervical area while permitting intercourse to take place, said spherical configuration permitting easy insertion without the necessity of orientation, said porous foam ball being impregnated with a solution containing a germicidal agent of the type and in an amount effective to control venereal disease and a contraceptively effective amount of a contraceptive agent.

4,309,998

PROCESS AND APPARATUS FOR OPHTHALMIC SURGERY

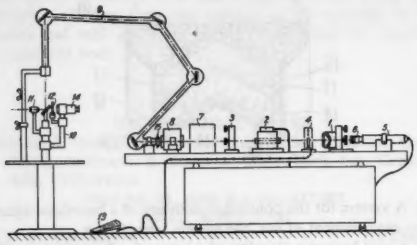
Daniele S. Aron nee Rosa, 28 avenue Raphaël, Paris, and Michele-Gabrielle R. Griesemann nee Laporte, 9 rue Alexandre Fleming, Bonneuil, Marne, Val-de-Marne, both of France

Filed Jun. 8, 1979, Ser. No. 46,630

Claims priority, application France, Jun. 8, 1978, 78 17111

Int. Cl.[3] A61N *5/00*

U.S. Cl. 128—303.1 12 Claims



1. A process for cutting biological tissue including transparent tissue in ophthalmic surgery, comprising bombarding tissue to be cut with a focussed pulsed laser beam, wherein the power density of the laser beam is greater than 10^{12} Watts/cm^2, and the duration of each pulse being between 20 and 400 picoseconds, the pulses being in the form of a train of from 5 to 9 spikes having a total energy of from 2 to 5 millijoules, the beam being passed through an optical focussing system having a strong converging effect.

4,309,999

EQUIPMENT FOR THE HOMOGENEOUS RADIANT CONDITIONING OF A ROOM ENCLOSURE FOR THERAPEUTIC PURPOSES

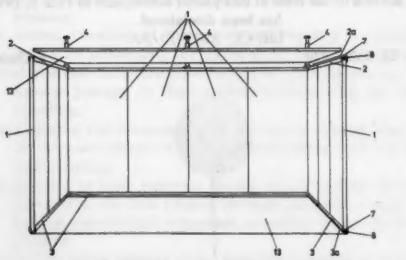
Holger Lueder, Loretostrasse 3, CH-6300 Zug, Switzerland

Filed Mar. 17, 1980, Ser. No. 130,709

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1979, 2912196

Int. Cl.[3] A61H *33/06*

U.S. Cl. 128—371 34 Claims



1. Equipment for the homogeneous radiant air-conditioning of a room, a tepidarium and/or a lounge with space enclosures (wall, doors, or ceiling) assembled of individual insulation boards, the sides of which that are facing the room are carrying an electrically conductive meander band that serves as surface heating element, which in turn is covered with an insulating plastic foil and shielded by a metal foil, characterized by means that increase the transfer of heat from the heating element to the heat-radiating surface of the insulation boards in such a manner that the temperature of this radiating surface is largely the same as the temperature of the heating element and is kept homogeneous; by connecting—at the edge at each end of each meander band by means of welded joints—stronger lead-in foil strips, attached to the rigid plastic foam board, with the metallic covering of the support foil of the metallic meander band that is firmly attached to the plastic foam board, said covering serving as heating element; by a coating—which reflects radiant heat and is protected against corrosion on the parts of the room enclosure that are not directly heated, particularly on the cold floor that is covered, in addition, in the areas of traffic, with skid-resistant netting having a mesh size of approximately one centimeter, which is impregnated with synthetic material; if desired, by a lounge in the tepidarium or a lounge with minitepidarium positioned over it, which consists of a bed frame sitting horizontally on legs, or suspended from the ceiling, over which a relatively coarsely knotted net is stretched, and which admits the heat radiation of the tepidarium or from the electrically heated insulation boards attached to the bed frame, as well as the cooler room air to the human body lying on it and to most of the surfaces on which the body is lying; by a ventilation of the room with cool air, entering through ventilating openings in the walls close to the cold floor, the size of which can be regulated, or through a ventilating slit of adjustable height between wall or electrically heated insulation board and floor, by which means the room air temperature can be lowered draftfree at least 4° C. below the mean radiation temperature of all radiant and reflecting areas of the room enclosure; possibly by a special impedance of the heat transfer from the electrically heated walls to the room air by means of a reinforcement of the boundary layer by an air cushion that is held in place by mechanical means at the surface of the vertically positioned electrically heated insulation boards, but permits the heat radiation from the insulation boards to enter the room unhampered; by a control device for the automatic adjustment of the mean radiation temperature of all heated surfaces of the insulation boards facing the room or the human body to a uniform and chronologically constant temperature that can be freely selected in the range from 22° C. to 45° C.; by a fire protection achievable with a fault current safety switch, based on the fact that the heating element is already disconnected from the power supply net at a fault current of 30 mA, which flows off from the heating element, via softened or burnt out insulation, to the ground shield, during overheating or spark-over at any point of the meander band through which the heating current flows, before the overheated spot or the spark-over can ignite the rigid plastic foam of the insulation board; by an alarm system to the tepidarium that is activated upon failure of the energy supply from the power line, or upon activation of a fault current saftey switch connected in series with the surface heating elements, or upon occurrence of an impermissibly high temperature, i.e., upon failure of the electronic control of the radiation temperature.

4,310,000

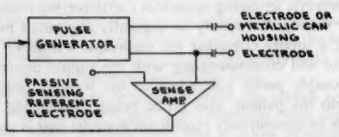
IMPLANTABLE PULSE GENERATOR HAVING SEPARATE PASSIVE SENSING REFERENCE ELECTRODE

Fredric W. Lindemans, Kerkrade, Netherlands, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jan. 23, 1980, Ser. No. 114,767

Int. Cl.[3] A61N *1/36*

U.S. Cl. 128—419 PG 6 Claims



1. In an implantable pulse generator having a terminal from which said implantable pulse generator both senses electrical activity and electrically stimulates body tissue via a single remotely attached electrode having a first surface area and

wherein a first reference electrode is used for said stimulating, the improvement comprising:

a second reference electrode electrically isolated from said first reference electrode fixedly attached to said implantable pulse generator used as a reference electrode for said sensing.

4,310,001

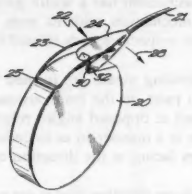
CONNECTOR ASSEMBLY FOR BODY IMPLANTABLE MEDICAL SYSTEMS

Richard H. Comben, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 21, 1980, Ser. No. 142,402

Int. Cl.³ A61N *1/00*

U.S. Cl. 128—419 P **15 Claims**



1. In a body implantable medical system of the type having means for providing a medical agent, means for delivering said medical agent to a desired body site and means interconnecting said medical agent providing and delivering means, the improvement wherein said interconnecting means comprises over-center toggle means.

4,310,002

ELECTROPALATOGRAPH

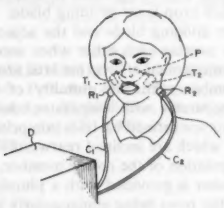
Kiyotoshi Takinishi, Koganei, and Shingi Iwasaki, Tachikawa, both of Japan, assignors to Rion Co., Ltd., Tokyo, Japan

Filed May 15, 1980, Ser. No. 150,216

Claims priority, application Japan, May 18, 1979, 54/61341

Int. Cl.³ A61B *5/10*; G09B *19/04*

U.S. Cl. 128—642 **5 Claims**



1. An electropalatograph for speech training and the like comprising an artificial palate device to be mounted to a trainee's hard palate as adapted thereto and having on one surface contacted with the hard palate a single electrode, on the other surface with which the trainee's tongue contacts a plurality of tongue-contact sensing electrodes distributed substantially over the entire area of said the other surface as spaced from each other and a plurality of lead wires respectively connected at one end to each of said sensing electrodes,

means connected to the other end of respective said lead wires to electrically detect contacting modes between said sensing electrodes and the tongue at the time of phonations for generating tongue-contact signals representing linguapalatal contact modes, and

means for indicating said linguapalatal contact mode on the basis of said tongue-contact signals,

said tongue-contact signal generating means including means for transmitting the tongue-contact signals as electromagnetic waves and being of a shape and dimensions capable of being accommodated within the trainee's mouth while allowing natural phonations to be performed, and said indicating means including means disposed outside the trainee's body for receiving said transmitted electromagnetic waves and converting received said waves into corresponding tongue-contact signals.

4,310,003

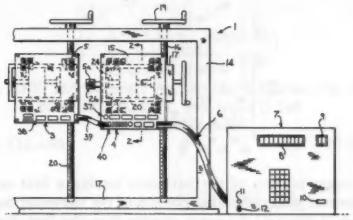
THERMOGRAPHIC METHOD OF PHYSICAL EXAMINATION OF PATIENTS

Kenneth J. Schlager, 12825 Elmwood Rd., Elm Grove, Wis. 53122

Continuation-in-part of Ser. No. 875,527, Feb. 6, 1978, Pat. No. 4,186,748. This application Feb. 4, 1980, Ser. No. 118,081

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—736 **5 Claims**



1. A method of physiological pattern detection and recognition of the physiological disorder in an in vivo body by alignment of a multiple sensor single array means defining a sensing area with the body wherein said array means includes a plurality of individual thermally responsive units located in a selected fixed pattern and developing individual signals related to the thermal state of the body of an aligned patient, comprising aligning an array means with respect to a first portion of the body to develop pattern data signals and a reference unit with respect to a reference body portion to develop at least one reference data signal, transmitting said individual pattern data and reference data signals to analog-to-digital processing means for storage in a digital memory means, aligning said same array means with respect to a second portion of the body and with respect to said reference portion, transmitting second individual pattern data and reference data signals to said analog-to-digital processing means for storage in said digital memory means and for processing in accordance with a spatial pattern recognition program within each sensed array and in one sensed array relative to the other and in the first and second sensed arrays relative to said reference data to produce an automatic determination of the significance of said signals, and displaying an encoded signal indicative of the diagnostic result of the pattern recognition process.

4,310,004

COMBINE HARVESTER RETHRESHER

Cyriel R. J. De Busscher, Sijsele-Damme, and Francois Van Herpe, Houtem, both of Belgium, assignors to Sperry Corporation, New Holland, Pa.

Filed Jul. 1, 1980, Ser. No. 165,151

Claims priority, application United Kingdom, Jul. 6, 1979, 23773/79

Int. Cl.³ A01F *12/26, 12/18*

U.S. Cl. 130—27 F **4 Claims**

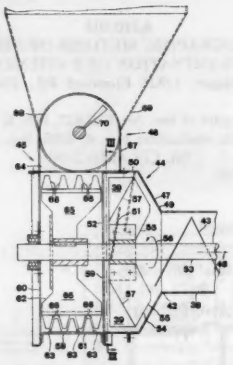
1. A combine harvester rethresher comprising:

an auger member rotatably mounted in an auger portion of said harvester;

a rethresher rotor member rotatably mounted in a rethresher portion of said harvester;

means for transferring crop material from said auger member to said rethresher rotor member, said means including an impeller rotatably mounted in a transfer portion of said harvester;

a shaft rotatably mounted in said harvester, said shaft coaxially carrying said auger member, said first impeller and said rotor member; and



said auger portion of the harvester having a first constant diameter, said rethresher portion of the harvester having a second constant diameter greater than the first diameter, said transfer portion including a sidewall extending from said auger portion radially outwardly to said rethresher portion, and said impeller of a construction sufficient for urging said crop material from said auger portion diameter radially outwardly toward said rethresher portion diameter.

4,310,005

COMBINE HARVESTER

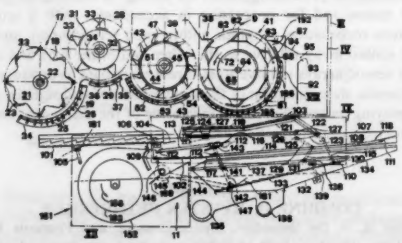
Cyriel R. J. De Busscher, Damme; Frans J. G. C. De Coene, Zedelgem, and Francois Van Herpe, Houtem, all of Belgium, assignors to Sperry Corporation, New Holland, Pa.

Filed Nov. 13, 1980, Ser. No. 206,609

Claims priority, application United Kingdom, Nov. 14, 1979, 39373/79

Int. Cl.³ A01F 7/04

U.S. Cl. 130—27 P **19 Claims**



1. A combine harvester comprising:

a transversely extending threshing mechanism having a threshing cylinder cooperable with a threshing concave for threshing a layer of crop material fed therebetween;

a separating mechanism having a separator rotor cooperable with a separator housing including a separator concave and disposed parallel to the threshing mechanism and being arranged spirally to convey portions of the layer of crop material received from the threshing mechanism towards each of its ends while submitting the crop material to a separating action;

a rotary member with a plurality of beater means transversely spaced apart on the width thereof disposed between the threshing mechanism and the separating rotor for orienting crop material in the layer of crop material received from the threshing mechanism generally lengthwise in the direction of movement of the layer;

crop layer diverting means for dividing the layer of crop material received from the threshing mechanism into said portions prior to the spiral movement thereof in the separating mechanism;

the crop layer dividing means are disposed for dividing the layer of crop material received from the threshing mechanism into two substantially equally sized portions;

the separating mechanism has a width greater than that of the threshing mechanism with its ends extending transversely past the respective ends of said threshing mechanism;

the crop layer dividing means are formed by blades which are disposed in pairs on the rotor around the circumference thereof and at opposed angles relative to the direction of rotation in a manner so as to define V-shapes having their apexes facing in the direction of rotation of the rotor;

the pairs of crop layer dividing blades are provided substantially at the middle of the separator rotor;

the crop layer divider blades are disposed at angles up to and including 55° relative to the rotor axis;

the apexes of the V-patterns of adjacent pairs of crop layer divider blades are staggered transversely of the rotor and relative to the fore-and-aft center;

a plurality of crop layer divider blades on the circumference of the rotor;

each crop layer dividing blade comprises an outwardly and rearwardly inclined leading edge as seen in the direction of rotation and an outer slightly arcuate edge generally coincident with the outer circumscribing line of said separator rotor;

the leading edges as seen in the direction of rotation of the rotor of each pair of crop layer dividing blades are transversely spaced apart;

an additional crop conveying blade at a distance from and parallel to each crop layer dividing blade;

each crop layer dividing blade and the adjacent crop conveying blade overlap each other when seen in the direction of spiral movement of crop material around the rotor;

the rotary member with the plurality of beater means thereon is cooperable with a separator concave;

the beater means are formed by tines comprising flat operative surfaces which are inclined rearwardly as seen in the direction of rotation of the rotary member;

the rotary member is provided with a plurality of rows of beater tines, the rows being equiangularly spaced around said member;

the rows of beater tines extend parallel to the rotary axis of the rotary members;

the beater tines of adjacent rows are staggered;

each beater tine is formed from sheet metal and comprises a pair of opposite side walls in addition to said rearwardly inclined operative surface;

a straw beater cooperable with a beater grate and disposed between the threshing mechanism and the rotary member for conveying crop material issuing from the threshing mechanism to the rotary member in a direction generally perpendicular to the direction of movement of the beater tines at the point where said beater tines intercept said crop material; and

the separator housing comprises a central forwardly facing inlet of a width substantially smaller than that of the housing for receiving crop material from the rotary member and substantially rearwardly facing outlets at the opposite

end portions thereof and transversely offset relative to the inlet for the discharge therethrough of crop material.

4,310,006

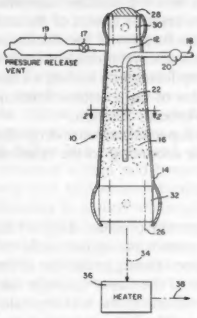
METHOD AND APPARATUS FOR EXPANDING TOBACCO

Charles H. Hibbitts; Byron F. Price, both of Chester; Everett C. Cogbill; James G. Kelly, both of Richmond, and James E. Glass, Sutherland, all of Va., assignors to American Brands, Inc., New York, N.Y.

Division of Ser. No. 892,316, Mar. 31, 1978, Pat. No. 4,253,474. This application Jul. 20, 1979, Ser. No. 59,315

Int. Cl.³ A24B *3/18*

U.S. Cl. 131—290 **6 Claims**



1. An apparatus for use in a process for expanding tobacco tissues which comprises in combination a vertically disposed vessel having an inlet pressure containing valve and an outlet pressure containing valve, a source of carbon dioxide and interconnecting means including a length of conduit disposed to communicate carbon dioxide from a source to each of a plurality of outlets positioned along said conduit within the vessel from which said carbon dioxide exits in the form of a mist including a mixture of gaseous and liquid constituents, and a mass of tobacco particles disposed within the vessel in communication with said outlets, said tobacco particles adapted to be uniformly impregnated by said carbon dioxide.

4,310,007

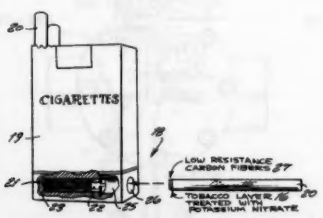
SELF IGNITING CIGARETTE

Imre Auersbacher, P.O. Box 43601, Tucson, Ariz. 85733

Filed Apr. 25, 1980, Ser. No. 143,643

Int. Cl.³ A24F *15/10*

U.S. Cl. 131—329 **5 Claims**



1. A self-igniting cigarette device in combination with a cigarette package, said cigarette package having a hollow interior in which is contained at least one cigarette, and a well at the bottom of said package, said well having a first end remote from a first side edge of said cigarette package, and a second end spaced from said first end, and a cavity also formed in said cigarette package at the bottom thereof, said cavity having a first end adjacent to said second end of said well to provide a continuous opening therebetween, and a second end remote from said first end in a direction away from said second end of said well, said second end of said cavity being formed in a second side edge of said cigarette package so that access to the interior of said well and cavity is possible from outside thereof; a battery mounted in said well, said battery having a first terminal and a second terminal; a first metal contact and a second metal contact, each being mounted in said cavity adjacent said first end of said cavity, said first and second terminals of said battery being in contact with said first and second metal contacts to provide an electric lighting element; and said at least one cigarette having an end thereof comprising an ignitable material, whereby when said end of said cigarette is placed against said first and second metal contacts by insertion through said second end of said cavity, said end will be ignited.

4,310,008

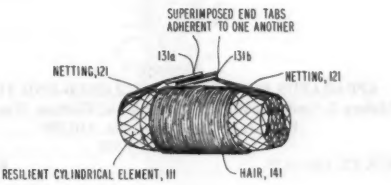
HAIR ROLLER

Mary S. Lalli, 113 Deepdale Rd., Strafford-Wayne, Pa. 19087

Filed Jul. 28, 1980, Ser. No. 172,568

Int. Cl.³ A45D *2/00*

U.S. Cl. 132—40 **13 Claims**



1. Hair roller comprising resilient cylindrical means, flexible longitudinal means adjoining the cylindrical means and extending in the axial direction beyond opposite ends thereof, the resilient cylindrical means being surrounded circumferentially by the flexibly longitudinal means, attachment means at opposite ends of the longitudinal means and adapted to adhere together detachably when juxtaposed to one another in mutual contact.

4,310,009

COMBING AND APPLICATOR DEVICE

Anthony D. Shipp, 351 N. Foothill Rd., Beverly Hills, Calif. 90210

Continuation-in-part of Ser. No. 871,192, Jan. 23, 1978, abandoned. This application Aug. 13, 1979, Ser. No. 65,851

Int. Cl.³ A45D *40/30*

U.S. Cl. 132—88.5 **18 Claims**

1. A combing and applicator device for applying treatment substance from a container to a surface comprising:

a housing means for attaching to said container and having a conduit means for passing treatment substance therethrough;

said conduit means having an inlet means disposed in communication with the container when said container is attached to the housing and having an outlet means comprising of a plurality of hollow teeth;

said conduit means having a chamber between the inlet and outlet means and adjacent to said hollow teeth; and

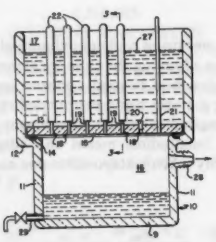
baffle means located in said chamber in the proximity of said hollow teeth, for equalizing the flow of fluid to each of said hollow teeth.

4,310,010

APPARATUS FOR CLEANING CLOSED-END TUBES

Melora J. Svoboda, 1525 Beechwood La., Grafton, Wis. 53024

Filed Jan. 7, 1980, Ser. No. 110,209
Int. Cl.[3] B08B 9/08
U.S. Cl. 134—135 6 Claims



1. A cleaning device for closed-end tubes, said device having a lower chamber and an upper chamber;

a generally horizontal removable plate separating the said lower chamber from the said upper chamber;

plural, generally vertical openings in the said horizontal removable plate;

vertical open tubes presented in the said upper chamber, each having one end engaged with one of the said vertical openings whereby the bore of each said vertical open tube constitutes a passageway between the said upper chamber and the said lower chamber;

means for establishing a pressure within the said lower chamber which is less than the pressure in the said upper chamber;

each said vertical open tube being adapted to receive and support a closed-end tube with inner surface annularly spaced-apart from the outer surface of the supporting vertical open tube.

4,310,011

METHOD FOR MAXIMIZING THE PUMPABILITY EFFICIENCY OF A HYDROCARBON SLURRY BY CONTROLLING THE WAX CRYSTAL CONTENT

James E. Tackett, Jr., Littleton, Colo., assignor to Marathon Oil Company, Littleton, Colo.

Filed Apr. 14, 1980, Ser. No. 139,889
Int. Cl.[3] F17D 1/16
U.S. Cl. 137—13 8 Claims

1. In a method of transporting a slurry through a pipeline wherein a hydrocarbon mixture is distilled in a distillation process and an overheads fraction from said process is used as a carrier fluid for congealed particles of a bottoms fraction from said process to form said slurry, the improvement for controlling the expected pressure drop of a slurry prior to introducing the slurry into the pipeline comprising:

(a) measuring a wax crystal content of the congealed particles of the bottoms fraction of the distillation process;

(b) determining the wax crystal content from the congealed particles in a slurry formed by adding a known amount of congealed particles of the bottoms fraction to a known amount of the overheads fraction;

(c) determining the expected pressure drop of the slurry in a particular pipeline according to the relationship:

$$P = ae^{bX}$$

where "P" is the expected pressure drop of the slurry in a particular pipeline in pounds per square inch, "a" and "b" are constants for the pipeline relating to the size of the pipeline and the expected flow rate of the slurry through the pipeline, and to the hydrodynamic volume of the wax crystals, respectively, "e" is the natural logarithm base constant, and "X" is the percentage of wax crystals by weight in the slurry from the congealed particles; and

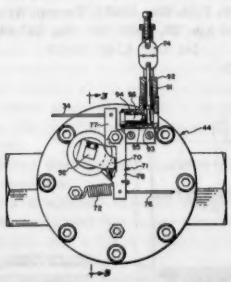
(d) modifying the composition of the slurry to obtain a modified slurry having an optimum or desireable expected pressure drop prior to introducing the slurry into the pipeline.

4,310,012

THERMAL AND REMOTE VALVE CONTROL

Evans R. Billington, Glenview, and Larry F. Odar, Northbrook, both of Ill., assignors to Rego Company, Chicago, Ill.

Filed Oct. 10, 1978, Ser. No. 949,692
Int. Cl.[3] F16K 13/04
U.S. Cl. 137—75 3 Claims



2. In a liquefied petroleum gas dispensing system having a control valve and valve operator means movable between an open position wherein said control valve is held open and a closed position wherein said control valve is permitted to close, a valve shutoff control unit comprising support means, valve operator activation means mounted upon said support means for movement relative thereto between a first and a second position, said valve operator activation means being operative in said second position to cause said valve operator

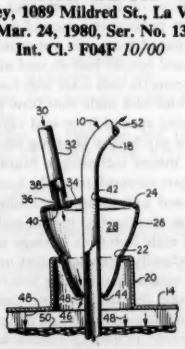
means to move to said closed position, first biasing means mounted upon said support means and operative to bias said valve operator activation means, and thermal control means mounted upon said support means and operative in response to temperatures above a predetermined range to cause said valve operator activation means to move from said first to said second position, said thermal control means including a movable actuator means mounted for movement upon said support means into and away from contact with said valve operator activation means, said actuator means being movable relative to said support means in a direction which is substantially transverse to the direction of movement of said valve operator activation means between said first and second positions, a thermal fusion link means extending between said support means and said movable actuator means, said thermal fusion link means operating in response to temperatures above said predetermined range to release said actuator means from said support means, and second biasing means connected between said support means and said actuator means to bias said actuator means away from said thermal fusion link means, said second biasing means causing movement of said actuator means upon the release thereof by said thermal fusion link means, said support means including a housing, said actuator means, thermal fusion link means and second biasing means being serially mounted within said housing with said thermal fusion link means and said second biasing means being connected to said housing in spaced relationship and said actuator means being connected to extend between said thermal fusion link means and said second biasing means, said actuator means having an opening extending therethrough intermediate the ends thereof, said valve operator activation means including an elongated cable, connection means for connecting said cable to a first side of said housing, said cable extending from said connection means through the first side of said housing, through the opening in said actuator means and outwardly from said housing through a second side thereof opposite to said first side and then to said valve operator means, said first biasing means being mounted within said housing and extending between said housing and a portion of said cable adjacent said second side of said housing to hold said cable taut, said first biasing means operating to bias said cable toward said second side of said housing, said connection means including a handle external to the first side of said housing and operative to draw said cable through said housing against the bias of said first biasing means, said cable also being drawn into said housing through the second side thereof against the bias of said first biasing means when said actuator means is released by and moves away from said thermal fusion link means.

4,310,013

SIPHON DEVICE

Billy M. McClaskey, 1089 Mildred St., La Verne, Calif. 91750

Filed Mar. 24, 1980, Ser. No. 133,630
Int. Cl.³ F04F *10/00*
U.S. Cl. 137—145 **10 Claims**



1. A device for siphoning fluids such as gasoline outwardly via the neck of a fluid container, said device including:

a first tube for flow of the fluid out of the container, said first tube having an outlet end and having an inlet end for immersion in the fluid;

a second tube having an outlet end and having an inlet end for the application of pressure thereto; and

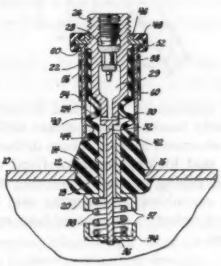
a hollow plug through which said first tube extends, said plug having a hollow interior, an expandable side wall positioned for sealing engagement with the neck of the container, means for connecting said second tube outlet end so that pressure in said second tube is applied within said hollow interior of said plug to expand said side wall into sealing engagement with the neck of the container, and a restrictive outlet positioned between said first tube inlet and the sealing engagement of said side wall and container neck to apply reduced pressure within the container and thereby to force the fluid from the inlet end to the outlet end of the first tube.

4,310,014

TIRE PRESSURE INDICATOR INTEGRAL WITH TIRE STEM

James E. Parker, Mt. Clemens, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 27, 1980, Ser. No. 163,707
Int. Cl.³ F16K *15/20*
U.S. Cl. 137—227 **4 Claims**



1. A tire pressure indicator coupled with a tire valve stem comprising

a valve stem having an elastomeric base portion for sealingly engaging a tire rim aperture, an integral convoluted portion and an outer nipple portion connected to the convoluted portion for axial movement with respect to the base portion in response to changes in tire pressure,

a tire stem valve secured in the nipple portion to admit air under pressure through the stem to a tire and to retain said air,

an elongated extension on the nipple portion passing through the base portion,

spring means coupled between the base portion and the extension for yieldingly holding the nipple portion against the force of the tire pressure to control the nipple portion movement relative to the base portion in response to tire pressure, and

indicator means coupled between the base portion and the nipple portion and responsive to the relative portions thereof to provide an indication of tire pressure.

4,310,015

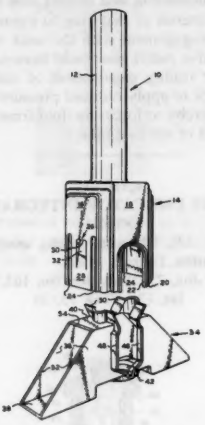
CURB BOX WITH SNAP-ON BASE

Robert C. Stewart, 7031 Brafferton Pl., Worthington, Ohio 43085, and Richard C. Stewart, 4483 Cassill Rd., Columbus, Ohio 43220

Filed Mar. 10, 1980, Ser. No. 128,633
Int. Cl.³ F16L *5/00*
U.S. Cl. 137—364 **4 Claims**

1. An underground curb box comprising, in combination, an elongated casing having an upper tubular portion and a lower

valve housing member, said housing member including end walls, lateral side walls and an open bottom defined by a bottom edge, conduit receiving openings defined in said end walls intersecting said bottom edge, a base member having a bottom portion and vertically extending wall portions, said wall portions having at least a partial plan configuration corresponding to at least a partial plan configuration of said lower valve housing member wherein said base member interfits with said



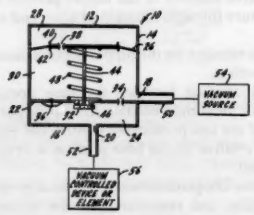
valve housing member to close said housing member open bottom, resiliently biased locking means defined upon one of said members, abutment locking means defined on the other of said members, said locking means defined on said members automatically engaging upon said housing member and base member being assembled by lowering said housing member upon said base member to retain said base member upon said housing member.

4,310,016

DIFFERENTIAL PRESSURE DELAY VALVE

John A. Aubel, Decatur, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 2, 1980, Ser. No. 155,242
Int. Cl.³ F16K *17/18*; F02M *3/00*
U.S. Cl. 137—493.8 **12 Claims**



1. A differential pressure delay valve, comprising:

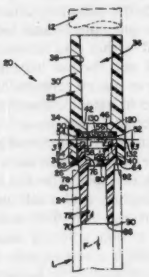
a wall structure defining an enclosure, a separating plate mounted in the enclosure to define an input chamber and an output chamber, which separating plate defines a port and an aperture between the input and output chambers, an umbrella valve operatively mounted in the separating plate to relieve an over-pressure condition, a diaphragm operator mounted in the enclosure to define a third chamber adjacent the input chamber, an aperture in the diaphragm operator to communicate between the input and third chambers, said wall structure defining an input port for the input chamber to provide an input connection, said wall structure also defining an output port for the output chamber to provide an output connection, a stem with a sealing means affixed near one end thereof, which stem extends through the separating plate port, through the input chamber, and is connected to and operative by the diaphragm operator, and a bias spring, positioned in one of the input and third chambers, effective to bias the diaphragm operator to close the separating plate port with the sealing means in the absence of a predetermined pressure difference between the third and input chambers.

4,310,017

BACKFLOW CHECK VALVE FOR USE WITH IV ADMINISTRATION SETS

Kenneth Raines, Bethlehem, Pa., assignor to Burron Medical Inc., Bethlehem, Pa.

Filed Jan. 30, 1980, Ser. No. 116,875
Int. Cl.³ F16K *15/02*
U.S. Cl. 137—533 **13 Claims**



1. A backflow check valve for use with IV administration sets comprising:

a female hub having a flow passage defined therethrough and a valve seat defined in said female hub;

a male hub having a flow passage defined therethrough and a coupling section thereon, said flow passages being positioned so that fluid communication can be established therebetween;

a sonic weld connecting said male and female hubs together;

a flow control disc movably located within said female hub flow passage and movable from a first position seated on said valve seat occluding said female hub flow passage to prevent backflow of fluid from said male hub to said female hub flow passage to a second position in which the entire disc is spaced from said valve seat permitting flow of fluid from said female hub to said male hub;

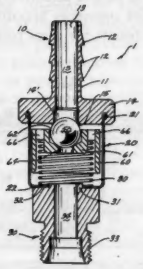
disc abutment means on said male hub for preventing a disc from moving into said male hub flow passage, said abutment means being spaced from said valve seat so that said disc traverses a gap before abutting said abutment means, said abutment means including a plurality of skirt members spaced apart circumferentially around said male hub flow passage and extending longitudinally of said male hub, and a cross rib attached to said male hub and extending across said male hub flow passage said cross rib being spaced longitudinally from said skirt members; and

disc flow bypass means on said male hub for permitting fluid to flow from said female hub flow passage through said gap and past said disc and into said male hub flow passage, said bypass means including spaces between said skirt members fluidly connecting said male hub flow passage to said female hub flow passage so that fluid can bypass said flow control disc when said disc is seated on said skirt members.

4,310,018
CHECK VALVE ASSEMBLY

Erwin W. Parr, and Timothy B. Brandt, both of Des Moines, Iowa, assignors to Parr Manufacturing Company, Des Moines, Iowa

Filed Feb. 13, 1980, Ser. No. 121,266
Int. Cl.³ F16K *15/04*
U.S. Cl. 137—539.5 **1 Claim**



1. An automotive fuel line check valve assembly designed for use in a minimal fluid pressure differential environment comprising:

a housing having an inlet port and an outlet port;

means forming a chamber within said housing, said chamber being in fluid communication with said inlet and outlet ports;

a spring biased reciprocating guide element having a generally cylindrical configuration in the form of an elongated cylindrical skirt member, which acts as a keeper mechanism for the biasing spring, and a plurality of fluid orifices radially disposed around a central recess formed in a central extension of the guide element, said central recess further being provided with a fluid orifice, in open communication with the fluid pressure downstream of the guide element,

a free floating ball valve, dimensioned to be rotatably received within said central recess, which is subject to the fluid pressure upstream and downstream of said guide element, wherein the downstream pressure on the ball valve is sensed through the fluid orifice in central recess, and

a helical spring, interposed between the central recess and cylindrical skirt, whose length to diameter ratio is such that the biasing spring force will only barely seat the ball valve in the inlet port during cessation of fluid flow through the assembly.

4,310,019
SAFETY VALVE

Gary A. Kohn, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Mar. 19, 1980, Ser. No. 131,793
Int. Cl.³ F16K *37/00, 31/44*
U.S. Cl. 137—553 **24 Claims**

1. A valve comprising:

a. housing means;

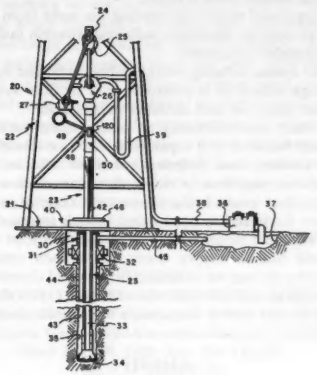
b. a longitudinal flow passage extending through the housing means;

c. valve closure means, disposed within the housing means, having a first position allowing fluid flow through the longitudinal flow passage and a second position blocking fluid flow through the longitudinal flow passage;

d. an operating sleeve means slidably disposed within the longitudinal flow passage and engaging the valve closure means to shift the valve closure means between its first and second positions;

e. a first longitudinal slot formed in the housing means and communicating between the interior and the exterior of the housing means;

f. a first pin means projecting through the first slot and engaging the operating sleeve means;



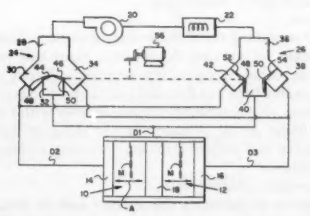
g. the first pin means being slidable within the first slot and a portion of the pin means extending exterior from the first slot; and

h. means for engaging the first pin means with a shifting tool to move the first pin means and operating sleeve mean longitudinally with respect to the housing means.

4,310,020
PROCESSING CHAMBER WITH AN AIR FLOW REVERSER

Knud Jespersen, Terracotta; Guy E. Buller-Colthurst, Rexdale, and Hans L. Bergner, Mississauga, all of Canada, assignors to Knud Simonsen Industries Limited, Rexdale, Canada

Continuation-in-part of Ser. No. 959,832, Nov. 13, 1978, Pat. No. 4,250,917. This application Nov. 23, 1979, Ser. No. 96,799
Int. Cl.³ F26B *21/04*
U.S. Cl. 137—563 **5 Claims**



1. A processing chamber with air flow reverser apparatus for use in association with an air flow system having air supply and return port means, said air flow reverser having;

a main supply duct, and a main return duct, said ducts being connectable to said respective supply and return port means of said air flow system;

at least two branch supply ducts communicating with said main supply duct;

at least two branch return ducts communicating with said main return duct;

supply damper means movably operable for selectively shutting off at least one of said branch supply ducts, while leaving at least one said branch supply duct open;

return damper means movably operable for selectively shut-

ting off at least one of said branch return ducts while leaving at least one said branch return duct open;

means interconnecting said supply and return damper means for movement in unison whereby when a selected one of said branch supply ducts is closed, a selected one of said branch return ducts is open;

power operated means for moving the same from one position to another simultaneously and wherein said processing chamber comprises;

chamber means defining two chambers arranged side by side through which air is passed by said air flow system;

side duct means in said chamber means, and,

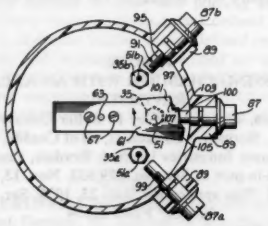
centre duct means defining an intermediate partition wall located between and separating said two chambers from one another, and defining a hollow interior, through which air may flow in either direction as aforesaid, said centre duct means being connected to one of said branch supply ducts and to one of said branch return ducts, and said side duct means being connected to at least one other of said branch supply ducts and branch return ducts whereby air may be caused to flow in said chamber means either from said side duct means to said centre duct means or from said centre duct means to said side duct means.

4,310,021

CONTROL VALVE

Fred Hauser, Los Angeles, Calif., assignor to Hydro-Rain Inc., Laguna Niguel, Calif.

Filed Apr. 2, 1981, Ser. No. 250,399
Int. Cl.³ F16K *31/52*
U.S. Cl. 137—624.2 **10 Claims**



1. A control valve comprising:

an actuator;

means for mounting the actuator for movement along a path;

motor means for moving the actuator along said path;

a valve including an operating member adjacent said path and movable between first and second positions to operate said valve, said actuator being engageable with the operating member as the actuator moves along at least a first segment of said path to hold the operating member in said first position;

a first movable selector; and

first cooperating means on the selector and the actuator and responsive to the position of the selector for displacing the actuator generally laterally of said path to a location in which the actuator does not hold the operating member in the first position whereby the operating member can move to the second position as the actuator moves along at least a portion of said first segment of said path.

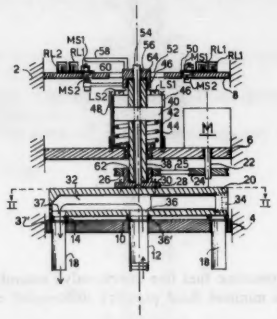
4,310,022

FLUID DISTRIBUTOR SYSTEM

William Cohen, Kibbutz Givat Chaim-Ichud, Israel, assignor to Givat Chaim-Ichud, Kibbutz Givat Chaim-Ichud, Israel

Filed May 7, 1980, Ser. No. 147,479
Int. Cl.³ F16K *11/02*
U.S. Cl. 137—624.18 **10 Claims**

1. A fluid distributor system, comprising: a circular distributor plate formed with a central opening connected at one side of the plate to a fluid inlet pipe and a plurality of outlet openings arranged in a circular array around the outer periphery of the distributor plate and each connected at said one side of the plate to one of a plurality of outlet pipes; a rotary distributor arm rotatably mounted on an axis passing through the center of said distributor plate and in spaced relationship with respect to its opposite side, said distributor arm being formed with a passageway having an inlet at its center aligned with said inlet opening, and an outlet at its end selectively alignable with one of said peripheral outlet openings according to the selected rotary position of the distributor arm; rotary drive means for



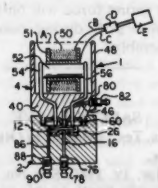
rotating said distributor arm to a selected rotary position; and axial drive means effective, when the distributor arm is rotated to a selected position, to move the distributor arm axially against the distributor plate to bring the inlet end of the distributor arm passageway into communication with the discharge plate inlet opening, and the outlet end of the distributor arm passageway into communication with the selected outlet opening of the distributor plate, said axial drive comprising a fluid motor having a cylinder and piston, one of which is fixed with respect to said distributor plate, and the other of which is coupled to said distributor arm.

4,310,023

MAGNETICALLY ACTUATED PILOT VALVE

Carl L. C. Kah, Jr., 778 Lakeside Dr., North Palm Beach, Fla. 33408

Filed Dec. 26, 1978, Ser. No. 973,299
Int. Cl.³ F16K *31/06, 31/08*
U.S. Cl. 137—625.5 **14 Claims**



4. A magnetically actuated pilot valve having a housing, said housing having two parts, means connecting said two parts together, a chamber being located between said two parts, a projection extending from one part into said chamber, a first passage in said one part extending through said projection and having a first opening in the end of said projection into said chamber, an armature plate positioned in said chamber, means for biasing said armature plate against the top of said extending projection closing said first opening, a second passage having a second opening into said chamber, pole piece means including two pole pieces extending into said chamber from said other part towards said armature plate, each pole piece having a free end extending toward said armature plate, means for

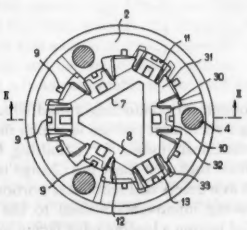
magnetically energizing said pole piece means to move said armature plate away from said first opening to a position adjacent the free ends of said pole pieces, the free end of one of said pole pieces being located near but spaced a small distance from a location adjacent the edge of the armature plate when it is positioned in said chamber against said first opening to close said first opening while the free end of the other pole piece is spaced a further distance from a location adjacent the opposite edge of the armature plate when it is positioned in said chamber against said first opening to close said first opening whereby this location of the free ends of said pole pieces with relation to the armature plate provides for an angular movement of said armature plate as it moves from its position against said first opening to its position adjacent the free ends of said pole pieces when they are magnetically energized by said means for magnetically energizing said pole pieces.

10. A magnetically actuated pilot valve having a housing, said housing having two parts, means connecting said two parts together, a chamber being located between said two parts, a first passage having a first opening into said chamber from one part thereof, an armature plate positioned in said chamber against said first opening, pole piece means including two pole pieces extending into said chamber from said other part toward said armature plate, each pole piece having a free end extending toward said armature plate, the free ends of said pole pieces being spaced from the armature plate, a second passage having a second opening into said chamber, means for magnetically energizing said pole pieces to move said armature plate away from said first opening towards said pole pieces, said armature plate being rectangular, said rectangular armature plate being permanently magnetized with a north pole location at one end and a south pole location at the other end, a portion of said chamber being rectangular to position said armature plate over said first opening and align said permanently magnetized armature plate with said two pole pieces so that the free end of one pole piece is over one end of said armature plate and the other free end of the other pole piece is over the other end of said armature plate.

4,310,024
CONTROL VALVE FOR FLUID ACTUATED DEVICE

Juan S. Bacardit, Barcelona, Spain, assignor to Bendiberica S.A., Barcelona, Spain

Filed Jun. 23, 1980, Ser. No. 162,214
Int. Cl.³ F16K *11/02*; F15B *13/04*
U.S. Cl. 137—625.21 **6 Claims**

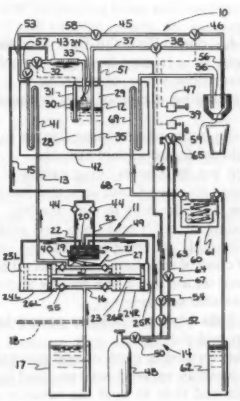


1. Control valve for fluid dynamic actuating device of the type comprising a discoidal chamber forming a stator (**1,2,3**) and having parallel end walls and a rotor (**8**) in the form of a starwheel comprising substantially radial arms, which is rotatable within said chamber starting from an angular rest position and which defines within said chamber fluidically separated enclosures, some arms, respectively supply arms (**12**) and discharge arms (**13**), being located so as to define ports having variable cross-section passages, respectively a supply passage (**14***a*) connected to a fluid supply source (**B**) and a discharge passage (**18***a*) connected to a fluid discharge (**19**), said stator comprising conduits (**20, 21, 22, 23**) for connection to both chambers of an actuating cylinder (C), characterized in that said rotor (**8**) is provided, between two contiguous supply and discharge arms, with an intermediate arm (**31**) which divides the corresponding enclosure into two cavities, one of which (**32**) for providing pressure is comprised between said supply arm and said intermediate arm and in whicn one aforesaid conduit is opening up and the other cavity (**33**) for providing modulation being comprised between said intermediate arm and said discharge arm, and that said intermediate arm is arranged to define intermediate ports (**34, 34***a*) with the facing portions of said end walls, said intermediate ports connecting the two aforesaid cavities and being provided with a variable cross-section passage (**34***a*), the cross-section of which is equal to or greater than the cross-section of said discharge passage (**18***a*) up to a determined angular position between rotor and stator from said rest position and decreases more than the cross-section of said discharge passage for a further relative rotation from this determined angular position.

4,310,025
SPOOL TYPE FLUID CONTROL VALVE

Gene A. Tracy, Amery, Wis., assignor to The Coca-Cola Company, Atlanta, Ga. and The Cornelius Company, Anoka, Minn.

Filed Jan. 29, 1980, Ser. No. 116,375
Int. Cl.³ F16K *3/24*
U.S. Cl. 137—625.48 **14 Claims**



1. In a fluid valve of the spool type having a valve body, an elongate bore within the body, an open end in the sleeve bore for receiving a sleeve therein, at least one insertable valve sleeve within the sleeve bore and having an internal valve bore and an outward facing shoulder at one end of the valve bore, and a reciprocable valve spool within the valve bore, said spool having at least one seal thereon, the improvement in the valve body comprising the integral one-piece construction in the valve body of:

(a) a concave seal pocket in a relatively closed end of the body, said seal pocket being generally coaxial with the valve bore;

(b) an annular face around and bounding the seal pocket and facing toward the sleeve;

(c) an inwardly faing annular bottom shoulder defining a bottom of the sleeve bore, said annular shoulder facing toward the open end of the sleeve bore, and abuttingly positioning the insertable sleeve in the body with respect to the annular face;

(d) a fluid conduit through the body; and

(e) surface means between the annular face and the annular shoulder defining at least part of a fluid plenum chamber into which the fluid conduit enters, for providing fluid

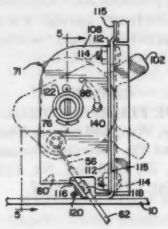
flow from across the annular face into the conduit and vice versa.

4,310,026

REMOTE CONTROL ARRANGEMENT FOR FLOW RATE VALVE

Robert J. Oliver, Westmont; Kenneth J. Lindblom, Clarendon Hills; Lloyd B. Idelman, Evanston, and Carl S. Medo, Oak Lawn, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 22, 1980, Ser. No. 114,179
Int. Cl.³ F16K *31/46*
U.S. Cl. 137—637 **2 Claims**



1. A means for controlling the flow rate to a plurality of hydraulic circuits on a tractor having a console, each circuit including a rotary flow valve, comprising:

a subframe including a pair of legs connected by a cross member;

said legs having outward extending flanges to permit attachment of said subframe to said console;

a hole in each leg, said holes being axially aligned;

a collar secured to one of said legs and having an opening coextensive with the hole in said one leg;

a shaft extending through said holes and said opening;

means for releasably securing said shaft to said collar;

a plurality of control members, each control member including a control sector and a hub having a given axial width greater than said sector;

each of said hubs having a bore to permit insertion of and rotation on said shaft;

an arcuate slot formed in each of said control sectors;

a limit bar releasably secured between said legs and extending through said slots to limit the rotation of said control members on said shaft;

a plurality of Bowden wires, each including a control cable and a sheath;

each control cable connected between one of said control sectors and a corresponding one of said rotary flow valves;

an angled flange formed on said cross member; and

means for releasably securing said sheath to said latter flange.

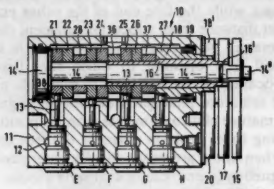
4,310,027

HYDRAULIC CONTROL DEVICES FOR USE WITH MINING APPARATUS

Walter Weirich, Dortmund, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Nov. 28, 1979, Ser. No. 98,182
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1978, 2851937
Int. Cl.³ F16K *31/524*
U.S. Cl. 137—637.2 **13 Claims**

1. In a hydraulic control device comprising a housing block containing a plurality of individual control valves operated by tappets and a rotatable cam shaft assembly actuated by hand lever means for displacing the tappets to operate the valves; the improvement comprising the cam shaft assembly is composed of a plurality of relatively rotatable cam shaft parts, each cam shaft part being partly rotatable by its own hand lever means is either rotational direction having cams mounted thereon which are arranged to actuate some of the valves each



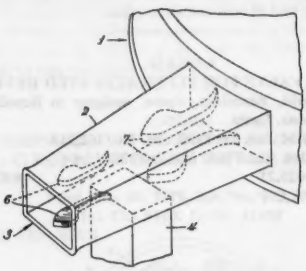
rotatable cam shaft part being further provided with at least one additional cam mounted thereon which is subjected to the action of a pair of spring loaded plungers which automatically restores the associated cam shaft part back to a pre-determined neutral position when its hand lever means is released.

4,310,028

METHOD AND APPARATUS FOR INCREASING THE FLUID THROUGHPUT OF A CONDUIT

John H. Kennedy, Sturgis, Mich., assignor to Patriark, Inc., Albuquerque, N. Mex.

Continuation of Ser. No. 567,827, Apr. 14, 1975, abandoned.
This application Mar. 24, 1977, Ser. No. 780,860
Int. Cl.² F15D *1/02*
U.S. Cl. 138—39 **17 Claims**



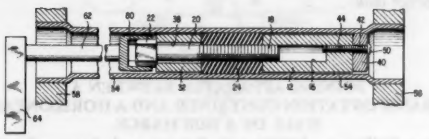
1. A fluid conduit for conducting a fluid which comprises a conduit having a rectilinear portion in which the flow of fluid tends to be rectilinear, means for admitting fluid into said rectilinear portion such that there is a change in the direction of flow of fluid as it enters said rectilinear portion, said rectilinear portion having immovably affixed to the inner surface thereof an airfoil having a leading edge facing into the rectilinear flow substantially at the place where the change in direction is completed and the rectilinear flow begins, upper and lower surfaces normal to said inner surface over which the fluid flows after being divided by said leading edge, said upper and lower surfaces having midportions which are planar and lie in parallel upper and lower planes and side surfaces which bridge said upper and lower surfaces and one of which is fixed to said inner surface and the other of which is spaced from said inner surface a distance which is not more than about one-fifth the diameter of the conduit at the point where the airfoil is affixed, said airfoil functioning to induce a vortex in said rectilinear portion and said rectilinear portion being free of any construction which interferes with the formation and maintenance of said vortex.

4,310,029

EXPANDABLE TUBE PLUG

Matthew Dudek, 18 Prospect St., Clark, N.J. 07066

Continuation of Ser. No. 881,365, Feb. 27, 1978, abandoned.
This application Apr. 10, 1979, Ser. No. 28,871
Int. Cl.[3] F16L 55/10
U.S. Cl. 138—89 1 Claim



1. In a heat exchanger tube plugging system of the type in which a radially expandable plug is inserted, in its unexpanded state, into one end of the heat exchanger tube, moved within the tube to a location adjacent the remote end thereof and, subsequently, rotated by means of a tool engaging the plug and extending outwardly from the one end of the tube to effect expansion of the plug and sealing of the tube, the improved tube plug comprising:

a first metal cylindrical body having a longitudinal axis, first and second ends each perpendicular to the longitudinal axis and a threaded bore extending inwardly from the first end and coaxial with the body, the external diameter of the body being less than the internal diameter of the heat exchanger tube;

a second metal cylindrical body having a longitudinal axis, first and second ends each perpendicular to the longitudinal axis and a through bore coaxial with the body, the external diameter of the second body being less than the internal diameter of the heat exchanger tube, the diameter of the through bore being slightly greater than the diameter of the threaded bore of the first body member;

a compressible cylindrical sleeve having a longitudinal axis, first and second ends each perpendicular to the longitudinal axis and a coaxial through bore, the external diameter of the sleeve in its uncompressed state being less than the internal diameter of the heat exchanger tube, the diameter of the through bore of the sleeve in its uncompressed state being slightly greater than the diameter of the threaded bore of the first body member, the sleeve being positioned between the first and second body members with the axes of the bodies and the sleeve being colinear;

a bolt having a head engageable by the tool and a threaded shank, the shank passing through the bores of the second body member and the sleeve and threading into the bore of the first body member, the head of the bolt bearing against the first end of the second body member;

a metal disc having a knurled circumferential surface and a diameter approximately equal to the external diameter of the first body member; and

means mounting the disc on the second end of the first body member for pivotal movement about an axis parallel to but offset from the longitudinal axis of the first body member,

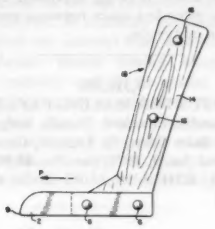
the arrangement being such that, upon initial rotation of the bolt when the plug is at the location adjacent the remote end of the tube, the metal disc engages the tube wall locking the first body member against rotation so that with continued rotation of the bolt, the bolt threads into the bore of the first body member to effect compression of the sleeve between the first and second body members forcing expansion of the sleeve outwardly into sealing engagement with the tube wall and inwardly into sealing engagement with the bolt shank preventing fluid movement therealong.

4,310,030

HAND-HELD WEAVER'S REED AND METHOD OF USE

Milka G. Yarlovsky, 13635 Grenoble Dr., Rockville, Md. 20853

Filed Apr. 11, 1980, Ser. No. 139,471
Int. Cl.[3] D03D 29/00
U.S. Cl. 139—29 11 Claims



1. For use in making a woven fabric having filling yarns joined to spaced warp yarns, a hand-held weaver's reed for beating up the filling yarns against the fell of the fabric comprising:

teeth support means;

a plurality of spaced, side-by-side, substantially parallel teeth secured to and projecting from said support means across the width of said support means, the spacing of said teeth approximating the spacing of the warp yarns of the fabric so that said teeth can be inserted between adjacent warp yarns to compress the filling yarns; and

a handle secured to said support means and having an elongated grip portion which extends transversely of the width of said support means and transversely of the direction in which said teeth project from said support means,

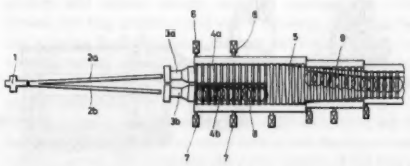
wherein said support means comprises a portion of the length of each of said teeth, a spacer between each pair of adjacent teeth alongside said length portion, and securing means for securing said teeth and said spacers together to form a laminated support structure for said teeth.

4,310,031

APPARATUS FOR FANNING OUT WIRE COILS

Manfred Appel, Kempen; Jörn Moslener, Düsseldorf, and Karl-Heinz Spiecker, Duisburg, all of Fed. Rep. of Germany, assignors to Mannesmann DeMag AG, Duisburg, Fed. Rep. of Germany

Filed Jul. 27, 1979, Ser. No. 61,516
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 2838155
Int. Cl.[3] C21D 9/56
U.S. Cl. 140—2 4 Claims



1. In an apparatus for fanning out wire coils continuously emerging from a wire mill and including severing means, laying means for forming the wire into coils, conveyor means for advancing the coiled wire in fanned-out form, to a bundling station, the improvement characterized by

(a) said conveyor means including a common conveyor, for the delivery of fanned-out coils to said bundling station, and first and second separate feed conveyors for the delivery of fanned-out coils to said common conveyor,

(b) said severing means and laying means cooperating for the deposit of alternate successive coils on the respective feed conveyors,

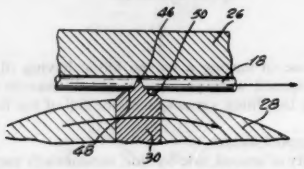
(c) individual, speed controllable drives for said feed conveyors, whereby either one of said feed conveyors may be temporarily driven slower than the other, during the period when a coil is being deposited on said one feed conveyor, to provide a space between successive coils on said common conveyor.

4,310,032

APPARATUS FOR MAKING PAPER CLIPS

Marcel H. Normandin, Brossard, Canada, assignor to Dextrous Engineering & Sales Corp., St. Laurent, Canada

Filed Jul. 9, 1979, Ser. No. 55,905
Int. Cl.³ B21F *3/00, 11/00, 23/00, 45/18*
U.S. Cl. 140—82 **7 Claims**



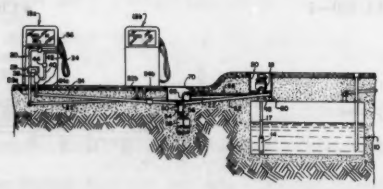
1. An apparatus for cutting a length of wire from a continuous wire member, including means for advancing the wire at a predetermined speed in a given path, means presenting a die surface adjacent the path of the wire, knife means on the opposite side of the path from said die surface adapted to intermittently engage the wire and press the wire against the die, and partially sever the wire; the knife means engaging the wire at predetermined lengths along the wire as it passes by the die, the knife means including a cutting blade edge for penetrating the wire and a pair of shoulders spaced from the blade edge a distance less than the thickness of the wire such that the shoulders engage and press the cut edges of the wire, and delivery means engaging the wire along the path downstream of the cutting station.

4,310,033

LIQUID DISPENSING AND UPHILL VAPOR RECOVERY SYSTEM

Elmer M. Deters, Muscatine, Iowa, assignor to The Marley-Wylain Company, Mission, Kans.

Filed Dec. 10, 1979, Ser. No. 101,520
Int. Cl.³ B65B *3/18, 31/00*
U.S. Cl. 141—44 **8 Claims**



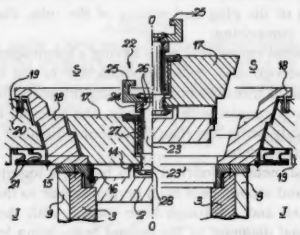
1. A liquid dispensing and vapor recovery system comprising storage means for said liquid, dispensing means for dispensing said liquid to a receptacle, first conduit means adapted to connect said storage means to said dispensing means, pump means for pumping said liquid from said storage means through said first conduit means and to said dispensing means, second conduit means connected to said first conduit means for diverting a portion of said liquid from said first conduit means, means responsive to liquid flow through said second conduit means for drawing the vapors from said receptacle into said second conduit means, a sump tank connected to said second conduit means for receiving said diverted liquid, third conduit means connecting said second conduit means to said storage tank for conveying vapor from said second conduit means to said storage tank, fourth conduit means connecting said sump tank to said storage tank, and means responsive to the operation of said pump for passing the diverted liquid from said sump tank to said fourth conduit means for passage into said storage tank.

4,310,034

JOINING APPARATUS BETWEEN A TRANSPORTATION CONTAINER AND A HORIZONTAL WALL OF A DISCHARGE

Rene Guilloteau, Verrieres le Buisson, and Jacques Segui, Fresnes, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 6, 1979, Ser. No. 17,900
Claims priority, application France, Mar. 9, 1978, 78 06821
Int. Cl.³ B65B *1/28*
U.S. Cl. 141—98 **12 Claims**



1. A joining apparatus between an orifice provided in an upper part of a container this orifice being equipped with a plug having clip means thereon, and an orifice in an horizontal wall in the lower part of a discharge enclosure, said wall being above said container, and apparatus comprising at an upper part of the container an adapting ring fitted about said container orifice and positioned with respect to said orifice of said wall, a protective ring for said plug the protective ring resting both on a shoulder of the adapting ring and on a shoulder of the container plug, a detachable cover closing said orifice of said wall, said detachable cover including relatively movable gripping means and resting on a cover seat connected to said wall of said discharge enclosure, said gripping means being able to seize said clip means of said plug of said container to simultaneously raise said plug and said cover to provide communication between said container and said discharge enclosure.

4,310,035

SHIELDING IN PACKAGING OF LIQUIDS IN HEATSEALABLE FLEXIBLE PACKAGING

Howard M. Turner, Mt. Vernon, Ohio, assignor to Ludlow Corporation, Needham Heights, Mass.

Filed Mar. 21, 1980, Ser. No. 132,687
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—97 **10 Claims**

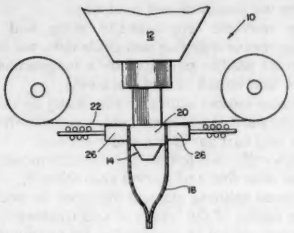
1. A process for packaging liquid compositions in packages having flexible, sealable areas for forming at the top of said packages, said process comprising the steps of

a. providing a continuous roll of shielding material

b. bringing an aperture in said shielding material into register with said sealable areas and a filling spout

c. moving said shield web into shielding position over the sealable surface of, and in register with, said sealable areas

d. filling said pouch while said shield is in said shielding position



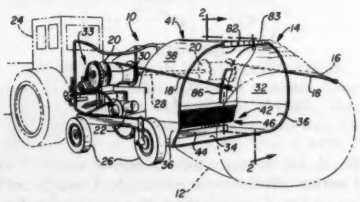
e. changing the relative position of said shielding material and said spout to present another aperture into register with another said sealable closure area.

4,310,036

TUNNEL CLEAN OUT MECHANISM FOR AN AGRICULTURAL BAG LOADING APPARATUS

David H. Rasmussen, Arlington, Nebr., and Richard H. Lee, Astoria, Oreg., assignors to AG-BAG Corporation, Arlington, Nebr.

Filed Jan. 21, 1980, Ser. No. 113,558
Int. Cl.³ B65B *1/10*
U.S. Cl. 141—114 **11 Claims**



11. An agricultural bag loading apparatus having a tunnel cleanout mechanism comprising:

an intake chamber;

an output chamber tunnel having a bottomwall, sidewalls, a topwall and a backwall;

a passageway connecting said intake chamber and said output chamber tunnel;

a primary shaft rotatably mounted in said intake chamber and having teeth thereon for compressing said material and forcing said material from said intake chamber, through said passageway and into said output chamber tunnel;

means mounted on said loading apparatus for stripping material from said teeth of said primary shaft, the interaction of said means and said primary shaft causing the material in said output chamber tunnel to be compressed and fed into an agricultural bag;

means to rotate said primary shaft;

means attaching the filled end of said agricultural bag to said loading apparatus, said means having a brake mechanism for yieldably permitting separation of the filled end of said agricultural bag and said loading apparatus in response to material being fed into said agricultural bag;

a tunnel cleanout plate pivotally mounted at its top edge to the top wall of said output chamber tunnel, said plate being pivotable from a retracted position in which said plate abuts the inner surface of the topwall and backwall of said tunnel and the lower edge of the plate coincides with the upper edge of said stripping means with all edges of said plate abutting portions of the inner surface of said tunnel to avoid interference with the feeding of material into the agricultural bag, to an extended position, pivotal movement of said plate from the retracted to extended positions causing the lower edge of said plate to define an arcuate path extending toward the filled agricultural bag and downward with respect to the upper edge of said stripping means, the pivotal movement of said plate means from the retracted to extended positions removing substantially all of the material from said tunnel;

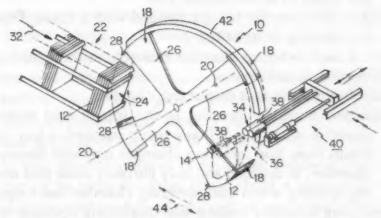
hydraulic cylinder means having reciprocating piston means, the exposed end of the piston means pivotally mounted to the surface of said plate adjoining the inner surface of said tunnel said cylinder means pivotally mounted on said loading apparatus outside of said tunnel, said tunnel being slotted for passage of said cylinder means and the piston means therethrough.

4,310,037

APPARATUS FOR MOUNTING VALVE BAGS TO FILLING SPOUTS OF FILLING MACHINES

Harold Seals, 100 Haney Dr., Chattanooga, Tenn. 37411

Filed Mar. 17, 1980, Ser. No. 131,033
Int. Cl.³ B65B *1/18, 43/26*
U.S. Cl. 141—166 **12 Claims**



1. An apparatus for automatically mounting valve bags on filling spouts of either a rotary or stationary type bag filling machine, each bag having a top, bottom, side and a valve means, comprising:

(a) at least one bag pickup and release means rotatably mounted about a rotational axis;

(b) a bag storage and feed means for storing and feeding a plurality of bags having the tops and bottoms folded to the sides, the storage and feed means positioned at a bag pickup station adjacent to the generally arcuate path defined by the rotating pickup and release means;

(c) A bag gripping and valve opening means for gripping the top of the bag and simultaneously (i) releasing it from the pickup and release means, and (ii) opening the valve means, the bag gripping and valve opening means including a means for ungripping the bag, the bag gripping and valve opening means positioned at a bag release station adjacent the generally arcuate path defined by the rotating pickup and release means;

(d) a conveyance and activating means for (i) conveying the bag gripping and valve opening means and the bag toward a filling spout, (ii) mounting the valve means of the bag on the spout, (iii) activating the ungripping means to ungrip the bag, and (iv) returning the bag gripping and valve opening means to the bag release station;

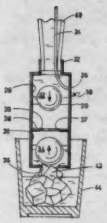
wherein the bag pickup and release means sequentially rotates past the bag pickup station to pickup the bag at its bottom and remove the bag from the storage means and then rotates to the bag release station wherein the top of the bag is inserted in the bag gripping and valve opening means whereby the bag is released from the pickup and release means, and then rotates to the bag pickup station to repeat the sequence.

4,310,038

METERING VALVE FOR BEVERAGE CONTAINERS

Lance S. Yule, Box 277, c/o Geofreeze Corp., Lorton, Va. 22079

Filed Aug. 11, 1980, Ser. No. 177,206
Int. Cl.[3] B65B *3/06*; B65D *47/00*
U.S. Cl. 141—351 3 Claims



1. A liquid dispensing metering valve comprising

a housing defining an upper internal metering chamber and a lower internal dispensing chamber separated from each other by a wall having a metering opening therein;

said metering chamber being provided with inlet means adapted for connection to the outlet of a container for the liquid to be dispensed, and

said outlet chamber being provided with a liquid dispensing opening at its bottom;

a ball in said metering chamber floatable in the liquid to be dispensed therefrom;

a movable plug in said dispensing chamber

said ball normally floating at the top of said metering chamber when it is full and being adapted, when liquid drains from said metering chamber into said dispensing chamber, to descend and only partially close said metering opening when said metering chamber has emptied;

said plug normally sealing said dispensing opening when said two chambers are full and having a portion protruding below the same;

whereby partially lifting said plug, as by engaging said projecting portion with a part of a beverage glass or its contents, will open said liquid dispensing opening and permit both said chambers to empty and said ball to descend and partially block said metering opening, and, when said plug has reseated itself, to permit said dispensing chamber and said metering chamber to refill successively and said ball to rise from said metering opening; and

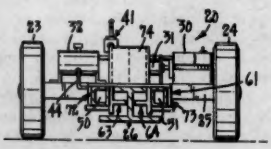
means establishing communication between the interior of said container and the atmosphere to admit air to replace the volume of liquid dispensed.

4,310,039

WOOD SPLITTER

John T. O'Brien, Rte. #1, Webster, Wis. 54893

Continuation-in-part of Ser. No. 32,156, Apr. 23, 1979, abandoned. This application Nov. 28, 1979, Ser. No. 98,222
Int. Cl.[3] B27L *7/00*
U.S. Cl. 144—193 A 10 Claims



10. In a wood splitter, in combination:

an elongated main rail;

a pair of guide rails aligned with and spaced oppositely from said main rail, to form therewith a longitudinal trackway;

means securing said guide rails at their ends to said main rail to define the length of said trackway;

a carriage movable longitudinally along said trackway, including means engaging said guide rails, and having first and second saddles separated by a longitudinal distance less than said length of said trackway;

a pair of linear motors acting longitudinally on said carriage at sites outward of said main rail to cause reversible movement of said carriage along said trackway;

a pair of inwardly directed splitter elements mounted on said main rail near first and second ends thereof;

a double-faced splitting element mounted on said main rail near the center of the length of said trackway; and

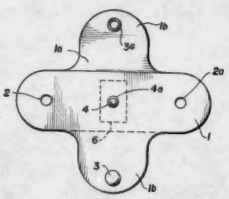
a pair of rams carried by said saddles for longitudinal movement between the center splitting element and the first and second end splitter elements respectively.

4,310,040

POUCH KEY HOLDER

Oded Shainfeld, 20 Kehilliath Budapest St., Tel Aviv, Israel

Filed May 23, 1980, Ser. No. 152,678
Claims priority, application Israel, Jun. 8, 1979, 57515
Int. Cl.[3] A45C *11/32*
U.S. Cl. 150—40 3 Claims



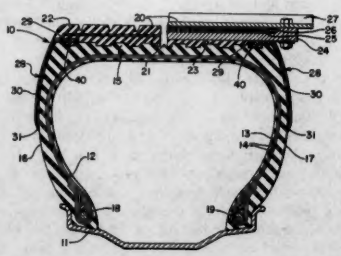
1. A pouch key holder which comprises two "T" shaped pieces of leather, plastics or the like material, said pieces being placed one on top of the other in such a manner that the horizontal webs of the "T" cover each other while the vertical "legs" extend to different directions and confront each other, there being further provided two screw bolts, pins or the like passing through the end portions of the web of the "T" pieces for the suspension therefrom of keys, as well as two sets of press buttons for closing the pouch.

4,310,041

TIRE WITH SIDEWALL PROTECTOR

George T. Watts, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 26, 1979, Ser. No. 15,492
Int. Cl.[3] B60C *27/00*, *27/06*, *13/00*
U.S. Cl. 152—187 8 Claims



1. In a tire comprising components of a tire carcass, a remov-

able traction element overlying the carcass, and a pair of sidewalls which at least partially surround the carcass; an annular non-rigid shield for covering and protecting the adjacent sidewall portion of the tire against damage from contact with external objects and for reducing entry of debris between the shield and the adjacent tire sidewall portion, the shield being separately manufactured from the tire carcass, the shield being of reinforced elastomeric material; the shield being generally L-shaped in radial cross-section and including

(a) a cylindrical portion which is secured between the traction element and the tire carcass, the cylindrical portion being of a manufactured inside diameter less than the outside diameter of the inflated tire carcass over which it is fitted;

(b) means carried by the cylindrical portion for forming a mechanical interlock with at least one of the two tire components between which it is secured; and

(c) an annular sidewall-covering portion extending generally radially inwardly from one axial end of the cylindrical portion, the annular portion at least covering and engaging the adjacent upper sidewall portion of the tire, the annular portion, when viewed in radial cross-section of the undeformed shield, being arcuate and of smaller radius of curvature than the tire carcass and the adjacent sidewall portion when viewed in radial cross section of the inflated tire, the annular portion including at least two layers of elastomer-coated cord fabric, the cords of adjacent layers of which extend at oppositely directed angles relative to the circumferential direction of the shield, the angle of each of the cords of the undeformed shield near the junction of the annular portion and the cylindrical portion being from about 30 to 65 degrees relative to the circumferential direction of the shield.

4,310,042

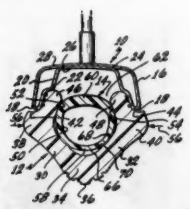
INSERT FOR NON-PNEUMATIC TIRES

Ransome J. Wyman, Calabases; Richard A. Alshin, Long Beach, and Charles H. Gilbert, Fullerton, all of Calif., assignors to Carefree Bicycle Tire Company, Marina Del Rey, Calif.

Continuation-in-part of Ser. No. 37,393, May 8, 1979, Pat. No. 4,273,176, which is a continuation-in-part of Ser. No. 906,691, May 16, 1978. This application May 9, 1980, Ser. No. 148,369

Int. Cl.³ B60C 7/12

U.S. Cl. 152—322 **6 Claims**



1. An improvement in a non-pneumatic tire having a solid monolithic tire body made of an elastomer for use on a wheel rim which includes a pair of laterally spaced bead flanges formed with side walls and extending upwardly from the bottom of the wheel rim which comprises:

said tire body having a circumferentially extending tunnel formed on the inside of said tire body;

said tire body having inclined side walls that converge at a crown, at least that portion of said tire body which includes the crown wherein said side walls meet with each other forming a contact surface wherein said tire body contacts a road surface;

each of said tire body side walls terminating in a thickened portion forming a bead shoulder that sits on the top of the bead flanges of said wheel rim and said thickened portion also including a bead extending essentially downwardly, the interior surfaces of said beads forming the lowermost side portions of said tunnel;

each of said beads fitting into said wheel rim adjacent to one of the side walls of said wheel rim;

a segment of tubing formed of a semiresilient material and capable of returning to its formed state after being distorted from said formed state by an outside force, said tubing having an integrally formed wall and a hollow interior, said tubing extending circumferentially within said tunnel around the inside of said tire body and contained in a cavity formed by said tunnel and the bottom of said wheel rim, said tubing sized to fit against the interior surfaces of said bead retaining said bead adjacent to said side walls of said wheel rim, at least the portion of said hollow tubing located closest to said contact surface of said tire body capable of being distorted inwardly into the hollow interior of said tubing if contacted by a portion of said tire body when said tire body is distorted in a direction toward said bottom of said wheel rim in response to distortion of said contact surface of said tire body by an object external said tire body;

said segment of semiresilient hollow tubing is a length of hollow tubing sized to fit within said hollow tunnel such that the respective ends of said length of said hollow tubing are positioned adjacent to one another when said hollow tubing is in said tunnel and said tire body is mounted on said wheel rim;

when said hollow tubing is located within said tunnel said hollow tubing has a greater resistance to distortion of its cross-sectional shape about a dimension which includes said portions of said wall of said tubing which fit adjacent to said interior surfaces of said bead compared to distortion of its cross-sectional shape about a dimension which includes said portion of said wall of said tubing positioned in said cavity closest to said contact surface of said tire body.

6. A semiresilient hollow tube sized to fit within the interior of a tire body which includes a circumferentially extending tunnel and a bead flange extending from the side walls of the tire body which comprises:

a hollow toroidal tube having a wall, said wall having an outside surface and an inside surface;

said hollow toroidal body formed of a semiresilient material capable of returning to its formed state after being distorted by an outside force from said formed state;

in cross-section said outside surface of said wall is formed into a circle and said inside surface of said wall is also formed into a circle;

the center of said circle formed by said inside surface being off center from the center of said circle formed by said outside surface such that the thickness measured between said outside surface and said inside surface of the wall in cross-section is of a different dimension about two points which with respect to the cross-section of said wall lie essentially 180 degrees from each other and said thickness measured between said outside surface and said inside surface of the wall in cross-section both to the right and left of said two points, respectively, gradually change from the dimension of the thickness of the wall at one of said points to the dimension at the other of said points;

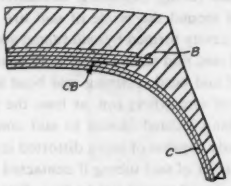
said tube positionable within said tire body such that said thickness of said wall at the one of said points which has the smaller dimension of said two points is located closer to the road surface contact surface of said tire than the other of said two points.

4,310,043

RADIAL TIRE

Teruo Inoue, Yao, Japan, assignor to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed Dec. 26, 1979, Ser. No. 106,462
Claims priority, application Japan, Dec. 26, 1978, 53-162996
Int. Cl.³ B60C *9/00, 9/18*
U.S. Cl. 152—356 R **6 Claims**



1. A radial tire for trucks and buses comprising a tread, a belt layer and a carcass layer characterized in that

(a) said belt layer is a three ply structure comprising first, second and third plies counted from said carcass layer and with all cords in said belt layer being steel cords disposed at an oblique angle of 15° to 25° relative to a circumferential direction of said tire and with the cords in the second and third plies immediately below said tread being disposed substantially in parallel with each other; and

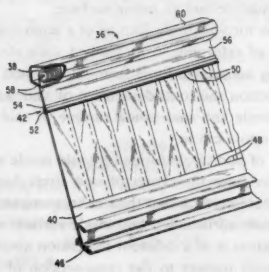
(b) a cord material used in said carcass layer has a K value of 10 to 15 as calculated by the equation $K = E/T$, wherein E is the tensile modulus of said cord material in kg/mm^2 and T is the breaking strength per unit area of the cord material in kg/mm^2.

4,310,044

ACCESS SHIELD FOR UNCOVERED REFRIGERATED UNITS

M. Allan Schenker, 17046 Burbank Blvd., #8, Encino, Calif. 91316

Filed May 11, 1979, Ser. No. 38,230
Int. Cl.³ E06B *3/80, 9/14*
U.S. Cl. 160—329 **18 Claims**



1. An access shield for thermally isolating an aperture in a refrigerated device from the ambient environment while permitting access through said aperture, comprising:

a plurality of resilient and substantially transparent panels having a first and second end wherein said one of said panels is adjacent to and partially overlaps at least one other of said panels;

means for disposing said panels across said aperture and tensioning each of said panels;

means for coupling said first end of said panels to said means for disposing and tensioning; and

means for securing said second end of said panels along a side of said aperture; said means for securing comprising:

(i) at least one rail assembly joined to said second end of said panels, said rail assembly having a guide member, and

(ii) a track member defining an elongated slot for selectively engaging said guide member, said track member having a longitudinal axis, and permitting said guide member to rotate therein about said longitudinal axis.

4,310,045

PROCESS FOR FORMING SHELL SAND WITH MOLTEN PHENOLFORMALDEHYDE RESIN

John G. Smillie, Aurora, Ill., assignor to Aurora Industries, Inc., Montgomery, Ill.

Continuation of Ser. No. 784,112, Apr. 4, 1977, abandoned. This application Mar. 24, 1980, Ser. No. 133,558
Int. Cl.³ B05D *7/00;* **B22C** *1/22*
U.S. Cl. 164—527 **9 Claims**

1. In a process of producing a shell mold or core wherein sand is coated with a phenolformaldehyde resin, said process comprising the steps of

(a) reacting phenol and formaldehyde at an elevated temperature to produce a reaction product consisting essentially of hot liquid phenolformaldehyde resin having a solidification temperature above about 160° F.,

(b) transferring the hot liquid phenolformaldehyde resin to a mixing station while maintaining the resin at an elevated temperature to prevent solidification of the hot reaction product,

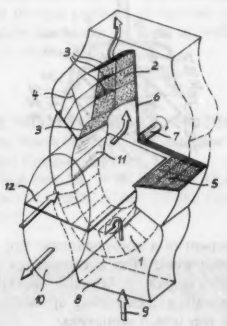
(c) mixing the hot liquid phenolformaldehyde resin with preheated sand at said mixing station to coat the sand with the resin.

4,310,046

REGENERATIVE HEAT EXCHANGER

Stanislaw Michalak, Reichshof, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Oct. 17, 1980, Ser. No. 197,797
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 2951279
Int. Cl.³ F28D *13/00, 19/00*
U.S. Cl. 165—5 **2 Claims**



1. A regenerative heat exchanger, including a rotor which is in the form of an annular body and comprises a plurality of rotationally symmetrical chambers which are separated from one another, the formation and separation of said chambers being effected by axially parallel dividing walls and radially extending dividing walls, said axially parallel dividing walls being permeable for gaseous heat-dissipating and heat-receiving medium, and said radial dividing walls being impermeable for said gaseous medium; heat-transferring elements for the regenerative heat exchange being arranged in said chambers,

said heat-transferring elements being accompanied by the formation of a whirl or fluidized layer during operation of said rotor.

4,310,047

TEMPERATURE CONTROLLER

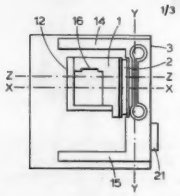
John Branson, Cambridge, England, assignor to PYE (Electronic Products) Limited, Cambridge, England

Filed Jan. 14, 1980, Ser. No. 112,042

Claims priority, application United Kingdom, Jan. 15, 1979, 01410/79

Int. Cl.³ F25B *29/00, 21/02*

U.S. Cl. 165—64 **6 Claims**



1. Apparatus for maintaining the temperature of an object at a desired value, which comprises a thermally conductive member for containing the object, a heat sink, a thermo-electric heat pump sandwiched between the thermally conductive member and the heat sink for maintaining the thermally conductive member at a substantially constant temperature, and an electrical resistance heating element in thermal contact with the heat sink to maintain the heat sink at a substantially constant temperature above the ambient temperature.

4,310,048

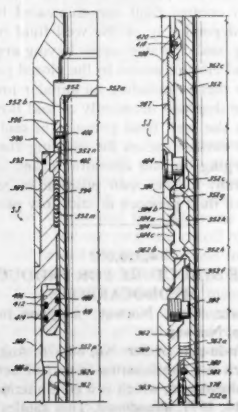
WELL SAFETY SYSTEM METHOD AND APPARATUS

James D. Mott, Houston, Tex., assignor to Hydril Co., Los Angeles, Calif.

Division of Ser. No. 2,197, Jan. 9, 1979, Pat. No. 4,260,021. This application Dec. 12, 1979, Ser. No. 102,912

Int. Cl.³ E21B *17/00, 23/00*

U.S. Cl. 166—212 **20 Claims**



1. A safety joint apparatus adapted for connecting in a well tubing for enabling controlled separation of the well tubing at partial well tubing tensile loading capacity and which is provided with full well tubing tensile loading capacity during installation;

a first tubular means having a flow passage formed therethrough and means for connecting with the well tubing below the safety joint;

a second tubular means having a flow passage formed therethrough for communicating with the flow passage of said first tubular means and a means for connecting with the well tubing above the safety joint;

shearable means for enabling separation of said first tubular means and said second tubular means at a tensile loading less than the tensile load capacity of the well tubing;

means for releasably connecting said first tubular means and said second tubular means, said means for releasably connecting having a tensile load carrying capacity at least equal to the load carrying capacity of the well tubing;

said means for releasably connecting is released by controlled relative longitudinal movement of said first tubular means to said second tubular means wherein said shearable means prevents separation of said first tubular means and said second tubular means under tensile loading after the controlled relative longitudinal movement therebetween; and

lugs on one of said tubular means engageable with slots on the other of said tubular members for reconnecting said first tubular means and said second tubular means after shearing of said shearable means to enable retrieval of said first tubular means from the well.

4,310,049

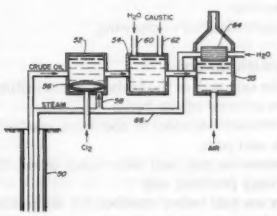
CRUDE OIL DESULFURIZATION

John J. Kalvinskas, Pasadena; George C. Hsu, La Crescenta, and John B. Ernest, Santa Ana, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Apr. 17, 1979, Ser. No. 30,831

Int. Cl.³ E21B *43/24;* C10G *27/02*

U.S. Cl. 166—267 **4 Claims**



4. A method of enhancing the recovery of oil from a well comprising the steps of:

recovering crude petroleum oil containing sulfur from a well;

treating the oil at the well site with molecular chlorine gas in the presence of water;

washing the oil to remove sulfur and chlorine reacting products;

recovering a desulfurized oil;

feeding the recovered desulfurized oil to a boiler;

burning the oil to produce steam; and

injecting the steam into the well to enhance the recovery of oil by steam flooding.

4,310,050

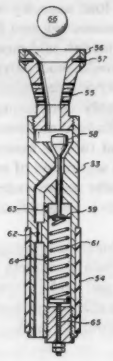
WELL DRILLING APPARATUS

Adam T. Bourgoyne, Jr., Baton Rouge, La., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 144,690, Apr. 28, 1980. This application Dec. 3, 1980, Ser. No. 212,573

Int. Cl.³ E21B *21/10*

U.S. Cl. 166—318 **6 Claims**



1. Flow control apparatus comprising,
a body,
seal means on the exterior of the body,
a diaphram mounted in said body,
a bore through the body including a reduced diameter orifice,
upstream and downstream ports on opposite sides of said orifice communicating the bore with opposite sides of said diaphram,
resilient means urging said diaphram toward its upstream pressure side,
a pressure regulator throttle in said bore controlling pressure in said upstream port in response to changes in pressure differential across said diaphram, and
a detachable catching sleeve secured to said body by a frangible member and adapted to support the apparatus in a landing nipple.

4. In combination:
a landing nipple-diverter comprising,
a body,
a bore through the body,
a port in the side wall of the body communicating the bore with the exterior of the body,
a valve member slidable in the bore controlling flow through said port,
resilient means urging said slide valve upwardly toward port closing position; and
a shoulder on said valve member for supporting a flow control device,
said bore having a section adapted to sealingly receive a flow control device; and flow control apparatus comprising,
a body,
seal means on the exterior of the body sealing with said bore section,
a diaphram mounted in said body,
a bore through the body including a reduced diameter orifice,
upstream and downstream ports on opposite sides of said orifice communicating the bore with opposite sides of said diaphram,
resilient means uriging said diaphram toward its upstream pressure side,
a pressure regulator-throttle in said bore controlling pressure in said upstream port in response to changes in pressure differential across said diaphram, and
a detachable catching sleeve secured to said body by a frangible member and supporting the flow control apparatus on said valve member shoulder.

4,310,051

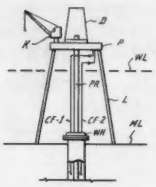
WELL SAFETY VALVE APPARATUS

James D. Mott, Houston, Tex., assignor to Hydril Co., Los Angeles, Calif.

Division of Ser. No. 2,197, Jan. 9, 1979, Pat. No. 4,260,021. This application Dec. 12, 1979, Ser. No. 102,881

Int. Cl.³ E21B *43/12*

U.S. Cl. 166—323 **7 Claims**



1. A subsurface safety valve for use in a well tubing to control flow of well fluids through the bore of the well tubing, including:
a tubular housing having a flow passage formed therethrough for the well fluids, said tubular housing having means for mounting said tubular housing in the well tubing to form a portion of the well tubing with said flow passage communicating with the well tubing for flowing well fluids therethrough;
flow closure means disposed in said flow passage for movement to and from an open position for enabling flow of well fluids through said flow passage and a closed position for blocking flow of well fluids through said flow passage;
operator means operably connected with said closure means for moving said closure means to and from the open and closed positions, said operator means moving said closure means to the open position in response to an increase in pressure of control fluid communicated to said tubular housing independently of the well fluid pressure in the well tubing, said operator means having urging means for moving said closure means to the closed position; and
said operator means including an annular pressure responsive surface disposed outwardly of said flow passage and exposed to the well fluid pressure in said flow passage above said closure means for assisting the control fluid pressure urging on said operator means for urging said closure means to the open position in response to increased well fluid pressure in said flow passage.

4,310,052

OFFSHORE STRUCTURE FOR PRODUCTION OF HYDROCARBONS

Johan A. Rivertz, Oslo, Norway, assignor to A/S Hoyer-Ellefsen, Oslo, Norway

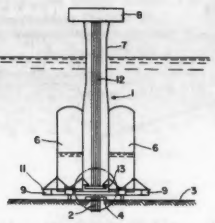
Continuation-in-part of Ser. No. 68,678, Aug. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 922,449, Jul. 6, 1978, abandoned, which is a continuation of Ser. No. 815,831, Jul. 14, 1977, abandoned. This application Aug. 29, 1980, Ser. No. 182,788

Int. Cl.³ E02B *17/02*; E21B *41/00*

U.S. Cl. 166—362 **9 Claims**

1. An offshore structure for production of hydrocarbons and constructed and arranged to be placed on top of pre-drilled wells in the sea bed, said structure comprising a base constructed and arranged to rest on the sea bed, said base compris-

ing at least one cell, at least one of said cells of said base being open at its lower end, a base plate at the lower end of said open-ended cell for closing said lower end of said open-ended cell, means for moving said base plate at least laterally relative to the open lower end of said open-ended cell, a plurality of conductors positioned in said at least one open-ended cell, said conductors being secured at their lower ends to said base plate



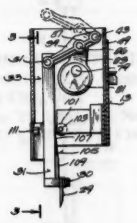
and having means, including said base plate, for placing said conductors into fluid communication with said pre-drilled wells for conveying hydrocarbons from said wells to an upper portion of said structure such that said base plate, during positioning thereof on top of the pre-drilled well, is moved at least laterally to facilitate mating of said base plate with the pre-drilled well and thereby ultimately to facilitate engagement of said base plate.

4,310,053

SOD CUTOFF MECHANISM

Richard E. Pearce, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 5, 1980, Ser. No. 146,259
Int. Cl.³ A01B *45/04*
U.S. Cl. 172—20 **2 Claims**



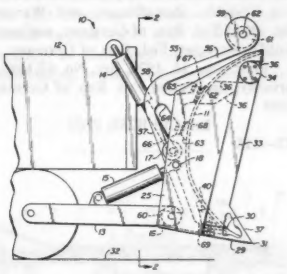
1. A sod cutter comprising a frame, means for movably supporting said frame for travel over the ground, means on said frame for stripping a ribbon of sod in response to travel of said frame along the ground, a cutoff blade, a rocker arm pivotally supported at one end by said frame and having a second end, a support bar carrying said cutoff blade and being pivotally connected to said second end of said rocker arm so as to effect sod-cutting movement of said cutoff blade in response to pivotal movement of said rocker arm, means for guiding movement by said cutoff blade so as to obtain, during forward travel of said frame along the ground and in response to arcuate rocker arm movement, generally vertical cutoff blade movement, retention of said cutoff blade in a vertical orientation during vertical cutoff blade movement in the vicinity of the ground, and rearward movement of said cutoff blade relative to said frame during downward movement of said cutoff blade, said means being located on said support bar intermediate said cutoff blade and said pivotal connection to said rocker arm and on said frame rearwardly of said support bar, and including a camming surface, and a roller positioned to engage said camming surface so as to guide cutoff blade movement, and means on said frame and connected to said rocker arm for pivotally moving said rocker arm so as to move said blade into and out of the ground to transversely sever the sod ribbon in response to travel of said frame along the ground.

4,310,054

RESONANCE AIDED EARTH-WORKING EQUIPMENT

Raymond A. Gurries, Reno, and Harry J. Stormon, Sparks, both of Nev., assignors to Resonant Technology Company, Sparks, Nev.

Filed Mar. 20, 1980, Ser. No. 131,989
Int. Cl.³ E02F *3/76*
U.S. Cl. 172—40 **24 Claims**



23. Earth-working equipment comprising:
a vehicle;
a transversely elongate earth-working implement having a concave, front earth-working surface, a correlative rear convex surface, and a transversely extending bottom edge;
means for coupling the implement to the vehicle;
a transfersely elongate cutter blade extending across the bottom edge of the implement;
means for mounting the cutter blade in downward closely spaced relationship from the bottom edge of the implement for reciprocal motion in fore and aft directions relative to the bottom edge of the implement;
first and second force transmitting beams each having two divergent approximately straight legs that meet at a juncture to form an acutate angle, a resonant frequency and a node at the juncture, a first anti-node at the end of one leg, a second anti-node at the end of the other leg at the resonant frequency, and an inward extension projecting from the juncture in a direction which generally bisects the acute angle;
a source of vibrations at or near the resonant frequency coupled to each of the first and second beams near the first anti-node;
means for mounting the first and second beams adjacent to the rear surface of opposite sides of the implement by attaching their respective inward extensions thereto so that the implement extends into the space between the legs of each beam with the first anti-node disposed near the top of the implement and the second anti-node disposed near the bottom of the implement within striking distance of the cutter blade to drive the cutting blade through the earth.

24. A bulldozer or the like comprising;
a tractor;
a transversely elongate mold board having a bottom edge;
means for coupling the mold board to the tractor for dozing purposes;
a transversely elongate cutter blade closely spaced from the bottom edge of the mold board;
means for mounting the cutter blade for reciprocal motion in forward and aft directions relative to the mold board;
means for applying unidirectional force impulses to the

blade in a forward direction to drive the blade intermittently forward without aft motion; and

guiding means for preventing sideward motion of the cutter blade, the guide means including a guide support secured to the back of the mold board from side-to-side, a plurality of elongated slots formed in the cutter blade in alignment with the direction of motion thereof, and a plurality of posts attached to the support, the posts each having protrusions elongated transverse to the direction of cutter blade motion riding in the respective slots.

4,310,055

PERCUSSION HAMMER WITH A ONE PIECE STRIKER

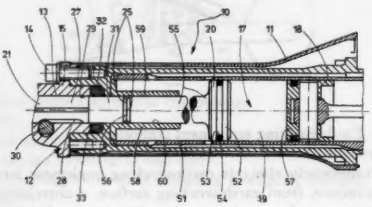
Karl Wanner, Leinfelden; Ludwig Thome, Leinfelden-Echterdingen; Jöerg Fäelchle, Bempflingen, and Werner Lehmann, Leinfelden, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 16, 1979, Ser. No. 67,164

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1978, 2844109

Int. Cl.³ B25D *9/04*

U.S. Cl. 173—118 **20 Claims**



1. A hand-held power tool, particularly a hammer drill and/or a percussion hammer, comprising a tool holder having an axis; a tool axially reciprocable in said tool holder and having a tool shaft with a rear end face; a housing having a guiding sleeve and a cylindrical sleeve wherein substantially the entire length of the guiding sleeve is located within said cylindrical sleeve; and a striking mechanism including an axially reciprocating drive piston located within said cylindrical sleeve and a striker actuated by said drive piston via an air cushion, said striker having a disc-shaped plate at its end facing toward said drive piston, and a striker shaft extending toward said tool holder, said disc-shaped plate of said striker having a relatively small axial dimension, said striker shaft having a cross-section whose dimension at least substantially corresponds to that of said tool shaft, said striker shaft being arranged to transmit impact energy directly to said rear end face of said tool shaft without an intermediate member, said striker shaft extending into and being slidably movable in said guiding sleeve lengthwise of the latter, said striker shaft having a front end face arranged to strike against said rear end face of said tool shaft, and a frustoconical rear end portion adjacent to said plate of said striker, said frustoconical rear end portion reducing in the direction toward said tool and toward said front end of said striker shaft.

4,310,056

PNEUMATIC-HYDRAULIC TOOL, PREFERABLY FOR BLIND RIVETING

Lars E. G. Olsson, Kyrkogatan 61 A, 671 03 Arvika, Sweden

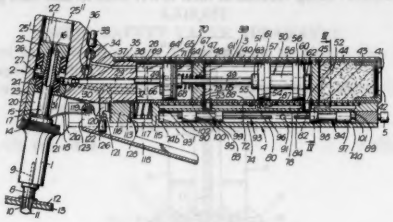
Filed Jan. 7, 1980, Ser. No. 109,978

Claims priority, application Sweden, Jan. 15, 1979, 7903125

Int. Cl.³ B23B *45/04*

U.S. Cl. 173—169 **10 Claims**

1. A pneumatic-hydraulic tool, preferably for blind riveting, comprising a hydraulic working piston in a hydraulic cylinder, cooperating with a chuck or corresponding gripping member, a pneumatic power piston device in an air cylinder adapted to provide a working pressure in the hydraulic medium by means of a plunger, a reservoir for the hydraulic medium, and a feed piston in the hydraulic reservoir, characterized in that the power piston device (**50**), the air cylinder (**51**), the plunge (**49**), the hydraulic medium reservoir (**69**), and the feed piston are



provided in an elongated grip handle (**6**), and that the plunge in the grip handle extends from the power piston device through the feed piston and through the hydraulic medium reservoir and further into a plunger passage (**29**) which is positioned ahead of the hydraulic medium reservoir, said plunger passage communicating with the hydraulic cylinder (**27**).

4,310,057

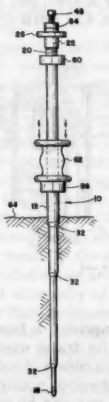
APPARATUS FOR EXTRACTING SUBTERRANEAN GAS SAMPLES

Durward B. Brame, 2510 Richmond Dr., Arlington, Tex. 76014

Filed May 30, 1980, Ser. No. 154,951

Int. Cl.³ E21B *49/08*

U.S. Cl. 175—21 **13 Claims**



1. Apparatus for extracting subterranean gas samples comprising:

an elongated stiff rod pointed on the lower end and having a gas passageway from adjacent the lower end to adjacent the upper end thereof, the rod being formed of an outer tubular shaft and a telescopingly received inner shaft longitudinally positionable relative to said outer shaft, said gas passageway being opened and closed by relative movement of said inner and outer shafts,

means for driving said rod into the earth whereby the lower end thereof is below the earth's surface;

a collar means rotatably received on said outer tubular shaft having means rotatably engaging said inner shaft providing means to telescopically move said inner shaft relative to said outer shaft to open and close said gas passageway whereby said passageway may be closed until said rod

lower end is driven beneath the earth's surface, after which said passageway may be opened; and

means adjacent the upper end of said rod for extracting a gas sample from said gas passageway.

4,310,058

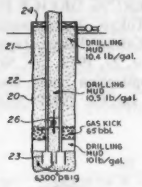
WELL DRILLING METHOD

Adam T. Bourgoyne, Jr., Baton Rouge, La., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 28, 1980, Ser. No. 144,690

Int. Cl.³ E21B *21/08, 21/10*

U.S. Cl. 175—48 **7 Claims**



1. Method of drilling a well comprising,

drilling a well with a drill string while circulating drilling mud,

determining that formation fluids have entered the well bore from a well formation,

determining the surface back pressure on said well bore which will prevent flow of formation fluids into the well bore,

injecting drilling mud into said formation fluid at a point above the lower end of the drill string, and

maintaining the well bore under a back pressure sufficient to prevent further flow of formation fluids into the well bore while flowing the mixture of formation fluid and drilling mud up the well bore-drill string annulus.

4,310,059

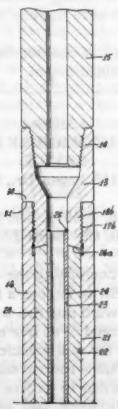
COMPOSITE HEAVY METAL DRILL COLLAR

Norman B. Moore, Salt Lake City, Utah, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Jan. 21, 1980, Ser. No. 113,681

Int. Cl.³ E21B *17/16;* **F16L** *9/14*

U.S. Cl. 175—320 **6 Claims**



1. A composite drill collar adapted to form part of a drill pipe string used in drilling a bore hole in earth formations, comprising an elongate outer pipe member, upper connector means adapted to secure the upper end of said outer pipe member to an adjacent drill pipe member thereabove, lower connector means adapted to secure the lower end of said outer pipe member to a drill bit therebelow, a rigid elongate annular member in said outer pipe member having a specific gravity at least twice the specific gravity of said outer pipe member, said annular member being in a solid state when placed in said outer pipe member, means for preloading said annular member in radial compression by a temperature responsive shrink-fit of one of the members against the other of said members along substantially the entire length of said annular member within said outer pipe member before the composite drill collar is lowered in the bore hole, said outer pipe member having sufficient wall thickness whereby substantially all bending, torsion, compression, tension and impact loads are transmitted from the adjacent drill pipe member thereabove through said upper connector means to said outer pipe member and from said outer pipe member to said lower connector means and to the drill bit without being imposed on said annular member.

4,310,060

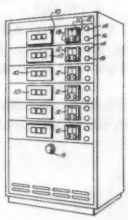
APPARATUS FOR MONITORING THE BLEND OF FIBERS

Samuel B. Phillips, Jr., and John M. Cochran, both of Greenville, S.C., assignors to Phillips Textile Marketing Co., Inc., Greenville, S.C.

Filed Jul. 11, 1980, Ser. No. 167,645

Int. Cl.³ G01G *19/22, 23/38, 13/16, 13/18*

U.S. Cl. 177—70 **6 Claims**



1. An apparatus for monitoring the blend of fibers being dropped onto a receiver by a plurality of weigh pans responsive to predetermined weights of said fibers being accumulated in said respective weigh pans comprising:

load cell means operably connected to each weigh pan generating an analog signal indicating the weight of said fibers accumulated in said weigh pan;

an analog to digital converter means converting said analog signal produced by said load cell means to a digital signal;

a digital display means for each of said weigh pans;

means for supplying said digital signal representing the weight of fibers in a respective weigh pan to one of said digital display means producing a visual display of the weight of said fibers;

a chart recorder for each of said weigh pans;

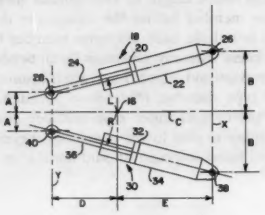
a digital to analog converter means connected to the output of said analog to digital converter means for converting said digital signal back to an analog signal and supplying said analog signal to said chart recorder, and

latch control means causing said analog signal being supplied to said chart recorder to record the full weight of fibers in a respective pan just prior to said fibers being dropped on said receiver.

4,310,061
STEERING GEOMETRY FOR ARTICULATED FARM TRACTOR

Jagdish C. Khanna, Downers Grove, and William C. Kanas, Darien, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 22, 1980, Ser. No. 114,178
Int. Cl.³ B62D 5/06
U.S. Cl. 180—139 **7 Claims**

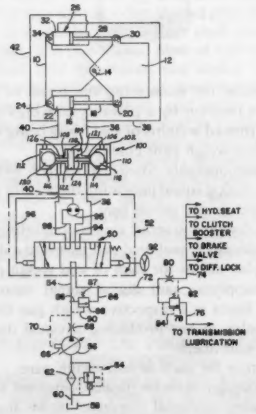


1. A steering arrangement for an articulated farm tractor capable of use in row crops having front and rear frames pivotally interconnected to define an axis of articulation comprising:
a pair of steering rams positioned on either side of said axis and pivotally connected between said frames;
each ram having a piston with a rod reciprocable within a cylinder; and
the distance between the pivotal connection of said rams to said front frame being substantially three times the distance between the pivotal connection of said rams to said rear frame.

4,310,062
HYDROSTATIC STEERING ARRANGEMENT

Erwin F. Link, Lansing, and William L. Schubert, Downers Grove, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 22, 1980, Ser. No. 114,431
Int. Cl.³ B62D 5/06
U.S. Cl. 180—139 **3 Claims**

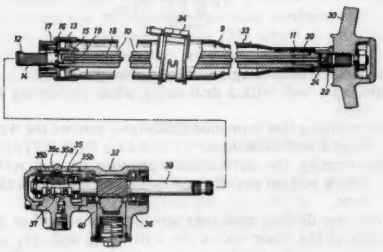


1. A steering system for minimizing drift induced by application of an external force to an articulated agricultural tractor comprising:
at least one steering cylinder for articulating said tractor;
a reservoir on said tractor;
a pump connected to draw fluid from said reservoir;
a hydrostatic steering unit for selectively directing flow from said pump to a high pressure side of said cylinder and connecting the low pressure side to reservoir; and
an alternating check valve interposed between said unit and said cylinder which permits free communication between said cylinder and each of said pump and reservoir upon actuation of said unit but which blocks communication only with the high pressure side when the pressures are induced by said external force.

4,310,063
POWER STEERING DEVICE FOR VEHICLES

Masao Nishikawa, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1979, Ser. No. 107,594
Claims priority, application Japan, Dec. 29, 1978, 53-163680
Int. Cl.³ B62D 5/08
U.S. Cl. 180—143 **9 Claims**



1. A power steering device for vehicles, comprising:
powering means for providing wheels of a vehicle with power assistance when the vehicle is steered;
control means for controlling said powering means in accordance with a steering direction of a steering wheel of the vehicle;
returning means for normally urging said control means to a neutral position thereof;
resilient means disposed between said returning means and said steering wheel for rotational displacement with a substantially linear spring constant, responsive to the steering torque, so as to thereby provide a variable steering ratio; and
said returning means and said steering wheel being interconnected by said resilient means.

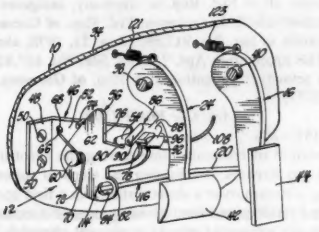
4,310,064
MULTI-PURPOSE AUTOMOBILE BRAKE ANTI-CREEP DEVICE

Adam Kazarian, Jr., 2155 Logan Dr., Sterling Heights, Mich. 48077

Filed Feb. 1, 1979, Ser. No. 8,524
Int. Cl.³ B60R 27/00
U.S. Cl. 180—271 **9 Claims**

1. A motor vehicle, comprising the combination of steering and driving road wheels, an engine, a fire wall, an accelerator foot pedal pivotable toward said fire wall to increase the speed of said engine and returned to its free engine-idle position by a spring, a service brake for said vehicle, control means such as a brake foot pedal pivotable toward said fire wall to apply said service brake and returned to its free brake-off position by a spring, drive means between said engine and said driving wheels to propel said vehicle, said drive means including an automatic transmission engagable to and from a vehicle drive condition, said vehicle having the potential of creeping when said transmission is in drive while said engine is operating and said brake and accelerator pedals are in their free brake-off and

engine-idle positions, as when the vehicle driver brings said vehicle to a stop at a traffic light and then removes his feet from said brake and accelerator pedals, and an anti-creep device to prevent said creep, said device comprising first latch means operative to lock said service brake in the brake-on condition only upon attainment of a predetermined position of said brake pedal in final movement thereof toward the full (floored) brake-on position, whereby the driver can alternately depress said brake pedal to any extent less than said predetermined position and release the same without locking said brake, and second means operative to unlock said service brake upon initial movement of said accelerator pedal from its free engine-idle position, whereby said service brake can be either left in the brake-on position or alternately locked in the brake-on position by operation of said brake pedal and automatically released by operation of said accelertor pedal without any action by the driver that would not be required in the absence of said device, bracket means extending toward said pedals from said fire wall and having said latch means mounted thereon, said latch means being pivotally mounted on said



bracket and retained in a free brake-locking position by resilient means urging the same against a stop, said latch having a locking element formed thereon, a member extending from said brake pedal toward said bracket and having a portion adapted to rotate said latch to its brake release position, whereby when said portion passes by said locking element of said latch, the latter will be automatically returned to its brake-locking position by said resilient means, said member comprising an extension of said brake pedal so as to be pivotable therewith and being formed with a bifurcated free end providing spaced arms and a pin extending through said space between the free ends of said arms, said bracket being positioned to be aligned with said space and formed at the free end thereof adjacent said brake pedal with a slot formed and adapted to receive said pin, said latch having a cam edge thereon adapted to be engaged by said pin upon pivoting of said brake pedal toward braking position so as to pivot said latch to its brake release position, said cam edge joining and terminating at said locking element which comprises a cut out area of said latch providing an edge to retain said pin when said latch is returned to brake lock position by said resilient means.

4,310,065

RADIAL HORN

Arnold I. Kayman, Huntington Beach, Calif., assignor to Chromalloy Electronics Corporation, St. Louis, Mo.

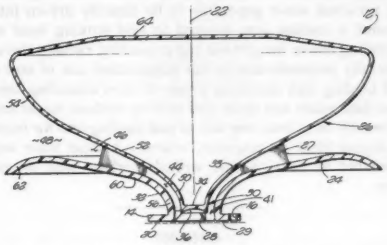
Filed May 11, 1979, Ser. No. 38,365
Int. Cl.³ G10K *11/00*
U.S. Cl. 181—159 **6 Claims**

1. A speaker horn for dispersing sound energy provided by a speaker drive assembly having a membrane for generating the sound energy, said speaker horn comprising:

a first sound-dispersing structure, substantially in the shape of a first surface of revolution about an axis, for restricting the propagation of the sound energy in one axial direction;

a second sound-dispersing structure, substantially in the shape of a second surface of revolution about said axis, for restricting the propagation of the sound energy in the other axial direction, said first and second sound-dispersing structures having walls for restricting the propagation of the sound energy in the axial directions, said walls defining a passageway therebetween to direct the flow of the sound energy, said walls at the input end of said passageway being substantially parallel to the primary direction of motion said membrane and said passageway being substantially noncontracting from the input end to the output mouth of the passageway;

at least a part of said second sound-dispersing structure being nested in said first sound-dispersing structure and having a surface transverse to said axis for facing the inner



portion of the membrane in sufficiently close proximity for cooperation with the membrane to force sound energy from the membrane away from said axis between and along the membrane and the cooperating surface and into said passageway in phase with sound energy emanating from peripheral portions of the membrane; and,

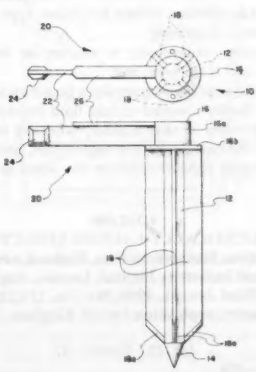
said cooperating surface and said first sound-dispersing structure defining an entrance to said passageway for facing the membrane, said entrance being shaped to recieve sound energy emanating substantially solely from membrane portions facing said cooperating surface and said entrance.

4,310,066

TORSIONAL SHEAR WAVE GENERATOR

Ihn J. Won, 319 Morrison Ave., Raleigh, N.C. 27608

Filed Feb. 22, 1980, Ser. No. 123,651
Int. Cl.³ G01V *1/053*
U.S. Cl. 181—121 **4 Claims**



1. A portable, lightweight and reusable torsional wave generator for producing seismic shear waves for use in investigating the earth's subsurface, comprising: a plurality of planar vane means radially projecting in parallel relationship about a longitudinal axis and projecting outwardly therefrom for engaging the earth; support means for rigidly supporting said

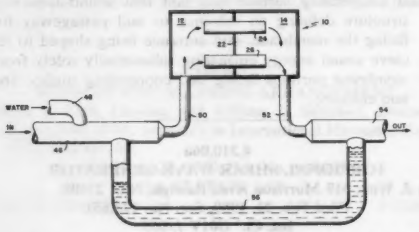
vane means about said longitudinal axis such that said vane means may be driven into the ground, said support means including an elongated shaft having a longitudinal axis and a ground entry end; a ground entry end; a ground penetrating spike end secured to said ground entry end of said shaft for enabling said torsional wave generator to be directly driven into the ground; a horizontal connecting structure secured across a top portion of said vanes and said shaft opposite said spike end about a plane generally perpendicular to said longitudinal axis of said shaft; driving head means secured to said torsional wave generator generally above said horizontal connecting structure for receiving an impact force for allowing the torsional wave generator to be directly driven into the ground; a loading arm secured to said striking head means extending above the ground and projecting radially therefrom generally perpendicular to the longitudinal axis of said shaft, said loading arm including a pair of sides extending laterally from said vanes and shaft; and striking surface means secured outwardly on at least one side of said loading arm for receiving an impact blow thereagainst, whereby a shear wave may be generated by striking said striking surface with an impact blow.

4,310,067

OPTIMIZED DIESEL ENGINE EXHAUST SILENCER

Donald C. Thomson, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 27, 1968, Ser. No. 779,329
Int. Cl.³ F01N *1/00, 7/08*
U.S. Cl. 181—228 **4 Claims**



1. An exhaust silencer system for piston type internal combustion engines comprising:

a fluid conduit comprising in tandem an exhaust pipe, a muffler, and a tail pipe; and

a bypass tube capable of trapping a liquid under the force of gravity, fluidly coupled to said fluid conduit to bypass at least a portion of said muffler, whereby at low exhaust pressure the liquid is held in said bypass, and at a predetermined higher exhaust pressure the water is expelled.

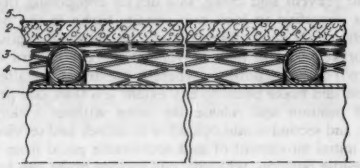
4,310,068

ACOUSTICALLY LAGGED STRUCTURE

James B. Erskine, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 31, 1980, Ser. No. 117,215
Claims priority, application United Kingdom, Feb. 28, 1979, 07086/79
Int. Cl.³ E04B *1/82*
U.S. Cl. 181—290 **10 Claims**

1. An acoustically lagged structure comprising an imperforate component that is to be lagged, a blanket of fibrous sound absorbing material supported by said component and spaced therefrom by a plurality of spacing members disposed at intervals along the length of the component, and a skin of material having a greater density than said blanket on the surface of the blanket remote from said component, at least one of (a) said spacing members and (b) said blanket being resilient, and there being no direct fastening of the skin to the component or to the



spacing members where the latter are not resilient, so that the skin is not close coupled to said component.

4,310,069

METHOD OF REDUCING NOISE DURING THROTTLING OF VAPOR AND GAS STREAMS

Fritz Kolb, Odenthal; Otto Ziegert, and Silvan Fehlisch, both of Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 917,693, Jun. 21, 1978, abandoned. This application Apr. 7, 1980, Ser. No. 137,922
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 2728778
Int. Cl.³ F01N *1/08*
U.S. Cl. 181—296 **5 Claims**

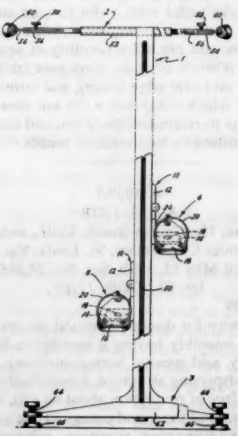
1. A method of reducing noise during the throttling of vapour and gas streams, comprising the steps of supercritically expanding a stream over a short distance in a first zone having a first cross-section, and then dividing up and decelerating the supercritically expanded stream in several channels in an immediate adjoining second zone, the flow cross-section of each channel in the second zone being individually smaller than that of the first zone, but collectively larger than that of the first zone.

4,310,070

LIFTING AND DESCENT MECHANISM-CRIKET

Spiridon A. Mastrogiannis, 9, Hniohou St., Galatsi, Athens, Greece

Filed Jun. 23, 1978, Ser. No. 918,578
Int. Cl.³ A63B *27/04*
U.S. Cl. 182—134 **3 Claims**



1. A climbing mechanism, comprising a load-supporting post member, means for supporting said post member in a generally upright disposition, a pair of foot-supporting pedal assemblies

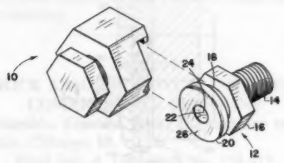
slidably attached to said post member for movement along the length of said post member, means for selectively locking and unlocking each of said pedal assemblies with respect to said post member, a first cable post attached adjacent the upper end of said post member, a second cable post attached adjacent the lower end of said post member, a flexible cable extending between said first and second cable posts, said cable running lengthwise and generally parallel to said post member, said means for selectively locking and unlocking each of said pedal assemblies comprising means on each of said pedal assemblies for selectively gripping and ungripping said cable.

4,310,071

GREASE FITTING CAP

Arthur E. Plow, Hammond, La., assignor to TK Valve & Manufacturing, Inc., Hammond, La.

Filed Jul. 23, 1979, Ser. No. 59,654
Int. Cl.³ F16N *11/00*
U.S. Cl. 184—88 R **5 Claims**



1. A grease fitting cap for use with button-head grease fittings which have a disc shaped button-head portion containing a central port in the outer face of the button-head portion and an annular groove around the button-head portion longitudinally offset from the face thereof, the cap comprising:

a housing, first means carried by the housing for removably attaching the housing to the button-head portion of the grease fitting utilizing the annular groove therearound, second means carried by the housing and movable with respect thereto, annular seal means carried by the second means and contactable with the outer face of the button-head portion surrounding the port thereof for sealing said port from leakage and contamination.

4,310,072

FLUID LINE COUPLING FOR FLUID ACTUATED EXTENSIBLE STRUCTURE

Dean E. Davis, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 17, 1979, Ser. No. 104,503
Int. Cl.³ B66B *9/20*
U.S. Cl. 187—9 R **16 Claims**

5. An upright for a lift truck comprising:

a fixed section;

a telescopic section slidably connected with said first member;

a load carrier slidably connected with said telescopic section;

a first fluid actuated cylinder assembly for extending said load carrier longitudinally of said telescopic section;

a second fluid actuated cylinder assembly for extending said telescopic section with said first cylinder assembly and said load carrier longitudinally of said fixed section;

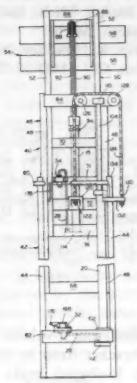
a fluid conduit adapted to connect said first and second cylinder assemblies, said conduit having a first portion and a second portion;

a first valve in said first portion of said conduit operatively connected with said first fluid actuated assembly; and

a second valve in said second portion of said conduit operatively connected with said second cylinder assembly;

said first valve being extended with said telescopic section to a selected position so that it is in spaced relation to said second valve without connection thereto of any kind whereby unobstructed visibility is provided through the upright;

said first and second valves being disengaged when said second cylinder assembly extends said telescopic section



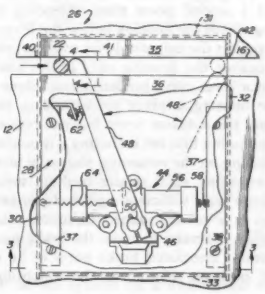
longitudinally of said fixed section, and said first and second valves being reengaged to form a continuous conduit of said first and second conduit portions between said primary and secondary cylinder assemblies when said telescopic section is retracted relative to said fixed section.

4,310,073

DRIVERLESS VEHICLE SPEED RETARDER

Richard Haring, Bethlehem, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.

Filed Feb. 19, 1980, Ser. No. 122,343
Int. Cl.³ B61K *7/02*
U.S. Cl. 188—62 **5 Claims**



1. A driverless vehicle speed retarder for use in retarding fast moving driverless vehicles under the effect of gravity while having little or no effect on slow moving driverless vehicles comprising a housing adapted to be mounted along a sloping guide path, said housing having a cover adapted to be flush with a floor, said housing having an opening through which a portion of a vehicle can extend as the vehicle moves along the guide path, a velocity responsive retarder mechanism mounted in said housing, said mechanism including a cantilever arm pivotable about a vertical axis with the free end of said arm being adjacent said opening for pivotable movement due to contact with a portion of a vehicle, said mechanism including a shock absorber coupled to said arm for retarding rapid pivotable movement of said arm while permitting slow pivot-

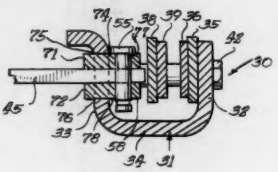
able movement of said arm, and means in said housing biasing said arm to a limit stop adjacent the upstream end of its range of pivotable movement.

4,310,074

BRAKE LEVELING AND POSITIONING STRUCTURE

Robert L. Kibler, St. Joseph, Mich., assignor to Lambert Brake Corporation, St. Joseph, Mich.

Filed Nov. 8, 1979, Ser. No. 92,571
Int. Cl.[3] F16D 55/224
U.S. Cl. 188—72.9 2 Claims



1. A brake suspended from a vehicle comprising, in combination, a mounting bracket fixed to and extending from the vehicle, a bi-legged, U-shaped brake housing for partially surrounding the brake disc and mounting bracket and defining an actuator lever-accepting slot, a plurality of mounting bolts extending between the brake housing legs and through the mounting bracket, each mounting bolt carrying a spacer bushing between the brake housing legs, a first stator friction element on one housing leg for engaging one side of the brake disc, a second stator friction element carried at least partially within the housing and slidably carried on the mounting bolt spacer bushings for engaging an opposite side of the brake disc, an actuator lever extending through the housing slot, the lever being connected to the housing and engaging the stator for drawing the housing in a given direction to urge the first stator friction element into disc engagement while driving the second stator friction element into disc engagement, actuator lever leveling means including at least one pivot plate extending through the actuator lever-accepting slot in the housing above the lever, and a second pivot plate extending through the lever-accepting slot in the housing below the lever, each pivot plate bearing against the actuator lever over an extended lever distance and against the housing only at the housing slot to urge the actuator lever into a predetermined plane of positions relative to the housing, a pivot pin extending through both pivot plates and the actuator lever but not restrained by the housing, the mounting bracket including a mounting plate and a mounting bushing on the mounting plate, the plate and bushing together engaging each spacer bushing means over an extended distance with sufficient rigidity to orient the spacer bushing means in a predetermined direction relative to the mounting bracket, whereby to cause the brake mounting bolt, and, consequently, associated brake parts to be carried in a predetermined position relative to the mounting plate and vehicle.

4,310,075

DISC BRAKE

Donald D. Johannesen, and Raymond P. Haluda, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 10, 1980, Ser. No. 128,425
Int. Cl.[3] F16D 65/02
U.S. Cl. 188—73.45 3 Claims

1. A disc brake comprising:

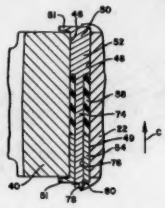
a rotor having friction faces on opposite sides thereof and rotatable about an axis perpendicular to the plane of said rotor;

a caliper cooperating with a pair of friction elements to urge the pair of friction elements into engagement with the friction faces on the rotor to retard rotation of said rotor;

a nonrotating torque member having a pair of axially extending slots for receiving a pair of pins, said caliper having a pair of axially extending slots which are substantially matched to said pin-receiving slots of the torque member;

a pair of pins disposed within said matching slots between said caliper and said torque member; characterized in that each one of said pair of pins includes a first and a second unyielding pin portion which are complementary in cross section to and received in said matching slots so as to establish a sliding fit between said caliper, said torque member, and said pin portions; said caliper and said torque member being spaced apart by said unyielding pin portions which comprise the sole means of transferring torque from said caliper to said torque member;

means for retaining said pair of pins in said matching slots, said pin retaining means including a first pair of tabs pro-



jecting radially from said first unyielding pin portions, said first pair of tabs cooperating with said torque member to prevent said pair of pins from moving through said matching slots in a first direction, said pin retaining means further including a second pair of tabs projecting radially from said second unyielding pin portions, said second pair of tabs cooperating with said torque member to prevent said pair of pins from moving through said matching slots in a direction opposite to said first direction, one of said first and second pin portions of each of said pair of pins includes an axially extending elongate shank, the other of said first and second pin portions of each of said pair of pins defining an axially extending bore receiving said shank, said first and second pin portions being secured one to the other by said shank carrying a removable retainer cooperating with said other of said first and second pin portions, and said first and second pin portions of each of said pair of pins being separable by removal of said retainer from said shank.

4,310,076

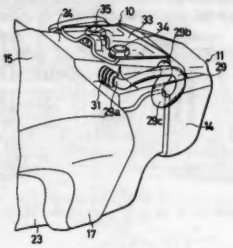
SLIDING CALIPER DISC BRAKE

Mituo Ikeda, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 5, 1979, Ser. No. 72,744
Claims priority, application Japan, Sep. 8, 1978, 53-110884
Int. Cl.[3] F16D 65/00
U.S. Cl. 188—73.35 1 Claim

1. A sliding caliper disc brake comprising a rotatable disc, a carrier member disposed at one side of said disc and having a pair of arms extending across the periphery of said disc, a caliper member straddling a portion of the periphery of said disc between said arms, brake pad means disposed on opposite sides of said disc and actuator means associated with said caliper means for moving said pads into engagement with said disc, a pair of axially directed bores disposed in opposite ends of said caliper member, pin means slidably disposed in said bores for guiding said caliper member for movement relative to said disc in the axial direction thereof, spring means comprised of four coil springs, each of said springs having a first end portion secured to a respective end of said pin means, a

second end portion fixed to respective arm and an intermediate portion having at least one coil winding for supporting said pin means on said carrier member and for biasing said caliper



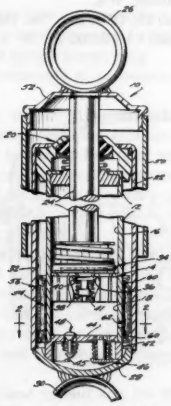
radially outwardly relative to said disc and a pair of retaining means secured to said arms and disposed in overlying relation to the ends of said caliper member to limit radial movement of said caliper member.

4,310,077

SHOCK ABSORBERS WITH IMPROVED COMPRESSIBLE CUSHIONS

John F. Whiteside, Franklin Park, Ill., assignor to Maremont Corporation, Chicago, Ill.

Filed Feb. 4, 1980, Ser. No. 118,313
Int. Cl.³ F16F 9/50
U.S. Cl. 188—282 **6 Claims**



1. A direct acting hydraulic shock absorber adapted to be connected between the sprung and unsprung masses of a vehicle comprising inner and outer tubular members, said inner tubular member defining a cylindrical chamber, a piston slidably mounted within said cylindrical chamber, a piston rod extending from one side of said piston outwardly from one end of said inner tubular member, closure means on said one end of said inner tubular member closing the adjacent end of said outer tubular member and slidably sealingly engaging said piston rod, an end closure on the opposite end of said outer tubular member, connecting means for operatively connecting said shock absorber between said masses, hydraulic fluid filling rebound and compression spaces within said cylindrical chamber on the piston rod side of said piston and on the opposite side thereof respectively and partially filling an annular reservoir space between said inner and outer tubular members, said piston having a central passage therethrough, rebound valve means in said piston disposed in cooperating relation with said passage, said piston having compression valve mechanism radially outwardly of said central passage to control flow, compression valve means between said compression space and reservoir space, and replenishing valve means between said compression space and said reservoir space, the improvement which comprises

said inner tubular member having an opening extending therethrough adjacent an end thereof,

a sleeve of elastomeric material surrounding the exterior periphery of said inner tubular member in covering relation to said opening, and

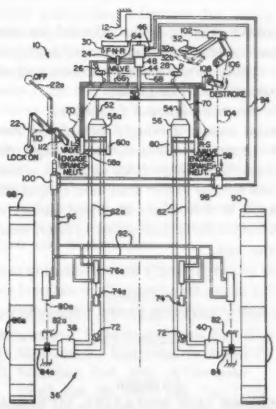
a rigid tube having a pair of axially spaced radially inwardly deformed annular beads disposed in spaced relation between the exterior periphery of said inner tubular member and the interior periphery of said outer tubular member in surrounding relation to said sleeve with said beads sealingly compressing the elastomeric material of the sleeve into sealing relation with the adjacent exterior periphery of said inner tubular member at annular positions spaced longitudinally on opposite sides of said opening so that hydraulic fluid within the adjacent space of said cylindrical chamber subjected to pressure can pass through said opening for confinement by the portions of the exterior periphery of said inner tubular member and the interior periphery of said sleeve between said annular positions.

4,310,078

DRIVE SYSTEM, CONTROLLING BRAKING SYSTEM THEREFOR, AND SAFETY LOCK CONTROLLING BOTH

Daniel B. Shore, Niles, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed May 1, 1980, Ser. No. 145,294
Int. Cl.³ B60K 41/20
U.S. Cl. 192—3 S **18 Claims**



1. A safety device system for a hydrostatic vehicle's drive and dual brakes, said drive comprising a prime powered dual path pump-motor hydrostatic drive including an oppositely disposed pair of hydrostatic drive motors having, at their fluid-supplied input, a bypass thereacross and arranged to be operatively connected to for bypasing the drive motors so as to provide drive in neither way between the source of prime power and the vehicle, and an oppositely disposed pair of hydrostatic pumps with hydraulic connections for normally supplying pumped fluid to the motor input, but also serving, whilst coasting so that the pumps motor their source of prime power for dynamic braking, to cause the motors to drive the pumps thereby loading the motors for dynamic dissipation of their power,

said system comprising an improved safety control arrangement including:

a safety lock handle (22); and

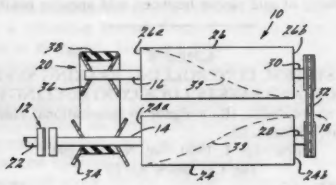
interconnections (92,96) operative from the safety lock handle to each of the dual motors (38,40) and dual brakes (82,82*a*) affording control of the former, in a removed, lock-on angular position, over the dualities of the latter for simultaneously bypassing both motors and applying both brakes, and affording the handle control, in a driver-obstructing lock-off angular position, over the dual pumps (56,56*a*), dual motors, and dual brakes for simultaneously releasing both brakes and restoring both motors to unbypassed condition so as not to interfere with both pumps in simultaneously motoring their source of prime power for dynamic braking and dissipation of power as described.

4,310,079

REGENERATIVE BRAKING DEVICE

Lyle O. Hoppie, Birmingham, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 19, 1979, Ser. No. 95,901
Int. Cl.³ B60K *41/28*; F16H *37/08*
U.S. Cl. 192—4 A **17 Claims**



1. A regenerative braking device adapted for connection to a mass having variable kinetic energy, said device comprising:

input drive means mounted for rotation and adapted for driving connection to said mass;

output drive means mounted for rotation;

energy storage means drivingly connected between said input and output drive means, said storage means operative to accumulate energy from said mass when said input drive means rotates faster than said output drive means and operative to deliver accumulated energy to the mass when said output drive means rotates faster than said input drive means; and

variable ratio means drivingly interconnecting said input and output drive means for varying the rotational speed of said input drive means relative to said output drive means.

4,310,080

RETARDER FOR ROTATING MEMBERS

Roger P. Jarvis, Leamington Spa, and David Parsons, Kenilworth, both of England, assignors to Automotive Products Limited, Warwickshire, England

Filed Dec. 3, 1979, Ser. No. 99,567
Claims priority, application United Kingdom, Dec. 7, 1978, 47493/78
Int. Cl.³ F16D *67/00*
U.S. Cl. 192—4 B **9 Claims**

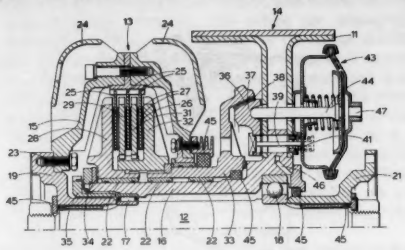
1. A rotation retarding mechanism comprising:

a rotational member;

rotational drag means;

a liquid immersed coupling comprising relatively rotatable input and output elements, the input element being connected to said rotational member and the output element being connected to said rotational drag means;

and dry brake means for holding the drag means against rotation, the drag value of the dry means being greater than the drag value of the coupling so that on application of the dry brake means the drag means is restrained and



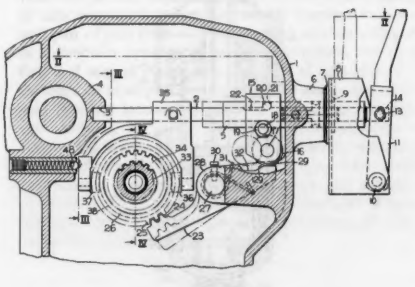
relative rotation can take place between the relatively rotatable elements in the coupling.

4,310,081

PARK LOCK AND RANGE SHIFT CONTROL

Ferdynand Kolacz, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 26, 1979, Ser. No. 106,684
Int. Cl.³ B60K *41/28*
U.S. Cl. 192—4 A **10 Claims**



1. A transmission park lock and shift mechanism on a vehicle transmission comprising, a transmission housing, a transmission including a drive shaft, a high-speed drive gear and a low-speed drive gear rotatably mounted relative to said shaft, a gear shift mechanism including a clutch for selectively coupling said shaft for drive through said high-speed drive gear and said low-speed drive gear, a transverse shaft means including a quill shaft receiving a transverse shaft extending into said transmission, a clutch sleeve in said clutch connected to said transverse shaft for selectively engaging said high-speed drive gear and said low-speed drive gear when said shaft means is pivoted on its axis, a park lock mechanism connected to said quill shaft for selectively locking said drive shaft responsive to reciprocation of said quill shaft, a bracket pivotally supported on said housing, a shift lever pivotally mounted on said bracket and pivotally connected to said quill shaft for selectively and alternatively reciprocating said quill shaft and pivoting said transverse shaft means for selectively operating said park lock mechanism and said gear shift mechanism.

4,310,082

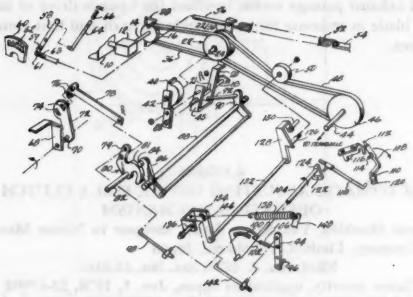
VARIABLE SPEED DRIVE AND COMBINED CLUTCH/BRAKE SYSTEM

Raymond L. Elmy, Franklin; Joe Crabtree, Lewisburg; Aaron A. Stevens, Spring Hill, and Randall K. Lawrence, Fairview, all of Tenn., assignors to The Murray Ohio Manufacturing Co., Brentwood, Tenn.

Filed May 21, 1980, Ser. No. 151,895

Int. Cl.³ B60K *41/20*

U.S. Cl. 192—11 **13 Claims**



1. A variable speed drive and combined clutch/brake actuating system for a ground-engaging vehicle having an engine power source, said system comprising:

a drive pulley connected to an output shaft of said power source;

an arm pivotally supported by said vehicle;

a variator rotatably supported adjacent an end of said arm, said variator including first and second belt-receiving portions separated by an element movable along the axis of rotation of the variator for varying the widths of said portions in response to the relative tautness of belts received in said portions;

an additional pulley operatively connected to a shaft for powering said vehicle;

a first belt operatively related to the drive pulley and received in the first belt-receiving portion of said variator;

a second belt received in the second belt-receiving portion of the variator and operatively related to the additional pulley;

spring means joined to said arm for biasing said arm in a direction tending to increase the tautness of said first belt;

a selectively adjustable speed control lever;

linkage means connected between said arm and the speed control lever, said lever and linkage means being operable to adjustably limit movement of said arm in response to the biasing of said spring means;

a pedal;

a cam element connected to said pedal and including a camming surface thereon;

a cam follower for engaging said camming surface;

means operatively connecting said cam follower to said arm whereby when said pedal is depressed to displace the camming surface with respect to the cam follower, said arm is pivoted to move in opposition to the biasing of the spring means thereby tending to decrease the tautness of said first belt; and

a brake-actuating arm connected to said cam element and displaced in response to further depression of the pedal for braking said vehicle.

4,310,083

DEVICE FOR CONNECTING A DRIVING ELEMENT TO A DRIVEN ELEMENT SO AS TO BE LOCKED AGAINST MUTUAL ROTATION, AND FOR SEPARATING THE SAME

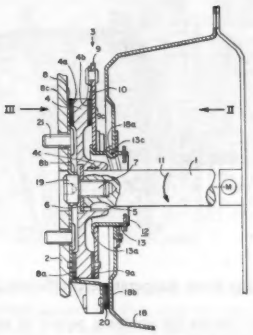
Edmund Maucher, Bühl,, Fed. Rep. of Germany, assignor to LuK Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Oct. 18, 1979, Ser. No. 86,149

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1978, 2845875

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—18 R **15 Claims**



1. Device for connecting a driving element to a driven element so as to be locked against mutual rotation, and for separating the same, comprising a friction disc being axially shiftable on the driving element and having two friction surfaces, said disc being fixed against radial movement and shiftable in axial direction, means for stopping the axial shift of said disc in direction away from the driving element, the driven element being in the form of axially shiftable friction parts being coaxial and engageable with said friction disc and rotatable relative thereto, each of said friction parts having a counterfriction surface disposed thereon, connecting means for transmitting torque between said friction parts, said connecting means being yieldable in axial direction and stiff in direction of rotation of said friction parts, and means for disengaging one of said friction parts from said friction disc.

4,310,084

FLUID-FILLED FRICTION CLUTCH

Manfred Nonnenmann, Schwieberdingen, Fed. Rep. of Germany, assignor to Süddeutsche Kühlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Jan. 30, 1979, Ser. No. 7,791

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804557

Int. Cl.³ F16D *35/00, 43/25*

U.S. Cl. 192—58 B **2 Claims**

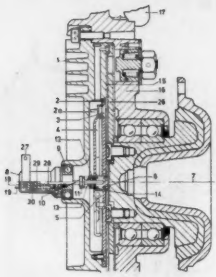
1. A fluid friction clutch, especially for driving the cooling fan of an internal combustion engine, said friction clutch including rotary drive means, a housing disposed coaxially with said drive means and capable of relative rotation therewith, said housing having a separating wall which defines a drive chamber and a fluid reservoir chamber, said rotary drive means being provided with a drive disc located in said drive chamber, and wherein said separating wall has a passage which provides communication between said drive chamber and said fluid reservoir chamber, and said clutch further includes a valve assembly for opening and closing said passage and a temperature-dependent actuator for actuating said valve assembly, the improvement wherein:

said temperature dependent actuator element is a power

element containing in a casing a substance which undergoes volumetric changes as a function of temperature and a working piston; and the improvement further comprising:

linkage means for transmitting motions of said working piston to said valve assembly, whereby expansion of said substance causes said valve assembly to close said passage to disengage said clutch;

resistive heater means housed with said power element for heating said power element in accordance with needed cooling requirements, said heater means being of the type



exhibiting a positive temperature coefficient (PTC resistor) and

thermal switch means for applying power to said resistive heater means as a function of temperature;

wherein said heater means is at least one PTC resistor, said working element and said PTC resistor are rotatingly disposed on that side of said housing remote from said drive means and in the approximate center thereof; and

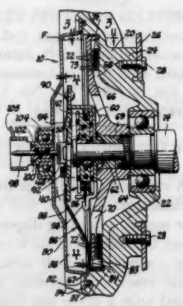
wherein said linkage means includes a valve actuating lever and a thrust bearing assembly for transmitting axial forces from said working piston to said valve assembly via said valve actuating lever.

4,310,085

ELECTRO-VISCOUS FAN CLUTCH

Frank E. LaFlame, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 6, 1979, Ser. No. 73,006
Int. Cl.³ F16D *35/00, 43/25*
U.S. Cl. 192—58 B **3 Claims**



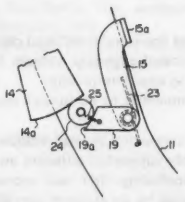
1. A fan for inducing air flow through a radiator in which engine coolant is circulated comprising a shaft member adapted to be rotatably driven, first clutch means operatively connected to said driven shaft for rotation therewith, second rotatably mounted clutch means spaced from said first clutch means to form a fluid shear space therebetween for receiving a viscous fluid so that said second fluid clutch means can be hydraulically driven by said first clutch means when a predetermined supply of fluid is maintained in said shear space, fan blade means secured to said second clutch means and extending radially outwardly therefrom, a cover plate attached to second clutch means to form a reservoir for a predetermined quantity of viscous fluid, said first clutch means having fluid pumping means for pumping fluid into said shear space from said reservoir, exhaust passage means in said first clutch means for exhausting fluid from said shear space into said reservoir, and electromagnetic control means drivingly secured to said shaft member for rotation therewith and disposed between said cover plate and said first clutch means for selectively closing said exhaust passage means to effect the viscous drive of said fan blade in response to the rotatable drive of said first clutch means.

4,310,086

AUTOMATIC ADJUSTING DEVICE FOR A CLUTCH OPERATING MECHANISM

Haruo Mochida, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 4, 1979, Ser. No. 45,416
Claims priority, application Japan, Jun. 6, 1978, 53-67908
Int. Cl.³ F16D *13/75*
U.S. Cl. 192—111 A **3 Claims**



3. An automatic adjusting device for a cable actuated clutch used in a vehicle, said cable actuated clutch being of the type in which a diaphragm spring is in constant contact with a release bearing, with a withdrawal lever operatively connected to said release bearing, and with one end of a cable connected to said withdrawal lever, said device comprising:

a first member pivotally mounted on pivot means, one end of said first member formed with a first curved surface, the other end of said first member operatively connected to the other end of said cable;

a clutch pedal pivotally mounted on said pivot means for movement toward and away from a home position;

a first spring for biasing said clutch pedal for rotational movement toward said home position;

a stopper lever pivotally mounted on said clutch pedal, said stopper lever having a stopper portion disposed between said clutch pedal and a body of said vehicle when said clutch pedal is at said home position;

a second spring for biasing said stopper lever for rotational movement with respect to said vehicle body, said second spring having a spring modulus which is lower than the spring modulus of said second spring;

a second member connected to said stopper lever for synchronous rotation therewith, said second member formed with a second curved surface; and

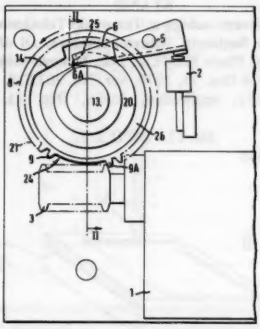
a roller configured to roll on said first and second curved surfaces and to be wedged between said curved surfaces when said clutch pedal is moved a predetermined amount for locking said first lever to said clutch pedal.

4,310,087

SINGLE REVOLUTION CLUTCHES, PARTICULARLY FOR FRANKING MACHINES

David A. Gawler, Brentwood, England, assignor to Vickers Limited, London, England

Filed Feb. 25, 1980, Ser. No. 124,522
Claims priority, application United Kingdom, Feb. 27, 1979, 6891/79
Int. Cl.³ F16D 43/26, 71/00
U.S. Cl. 192—142 R 4 Claims



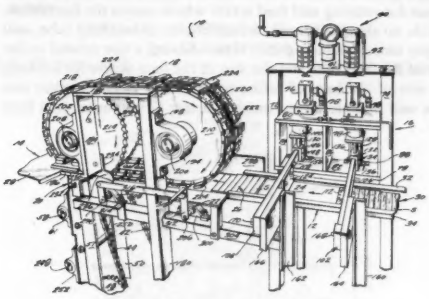
1. A single revolution clutch mechanism comprising a motor, a driving worm gear connected to a drive shaft of said motor and mounted to rotate about a first axis, said driving worm gear being mounted for axial movement along said first axis and formed with a constant radius, constant pitch helical tooth having a portion thereof of reduced depth, a split worm wheel mounted to rotate about a second axis to be driven thereabout by said driving gear, said split worm wheel being split on a plane to which said second axis is perpendicular providing first and second worm wheel parts mounted for relative angular displacement about said second axis, said first and second worm wheel parts being formed respectively with first and second similar circumferential arcuate rows of worm wheel teeth each with a gap between the ends of the respective row of teeth to provide a common gap between said ends when said rows are circumferentially in register with one another, said driving worm gear being mounted to project into said common gap without driving either of said worm wheel parts when the clutch mechanism is disengaged but to drive said worm wheel parts when the clutch mechanism is engaged for rotation of said split worm wheel through a complete revolution, lost-motion connecting means between said two worm wheel parts whereby said first worm wheel part can initially be brought independently of said second worm wheel part from its disengaged position into driving engagement with said driving worm gear to be driven thereby alone until said lost-motion connecting means closes to provide a driving connection between said two worm wheel parts thereby causing said split worm wheel to be driven as a unit, control means for initiating said engagement of said first worm wheel part with said driving worm gear and for arresting the movement of said first worm wheel part when the gap in said first circumferential arcuate row of worm wheel teeth registers with said driving worm gear thereby disconnecting the driving connection between said driving worm gear and said first worm wheel part while said driving worm gear continues to drive said second worm wheel part, thereby opening said lost-motion connecting means until said arcuate rows of worm teeth are circumferentially in register, and an abutment member at one end of said motor and a spring interposed between said abutment and said driving worm gear, the arrangement being such that when said driving worm gear is continuously rotating and said first worm wheel part is brought into engagement with said driving gear, said driving worm gear can yield axially from a normal driving position against resilient restraint provided by said spring until said helical tooth portion of reduced height registers with the leading tooth of said first arcuate row of teeth to permit said spring to return said driving worm gear to said normal driving position.

4,310,088

IN-LINE FEED SYSTEM

Charles E. Tibbals, P.O. Drawer A, Oneida, Tenn. 37841

Filed May 30, 1979, Ser. No. 44,211
Int. Cl.³ B65G 47/30
U.S. Cl. 198—425 9 Claims



1. An improved in-line feed system for feeding a plurality of individual wood parquet tile slats, each having a long and short dimension, along a predetermined in-line path and for dividing those incoming slats into predetermined sized groups while registering and orienting the slats in each group, said system including first conveyor means for continuously moving slats along said in-line path, metering means for dividing said slats into groups comprised of a predetermined number of slats, said metering means positioned above said first conveyor means, second conveyor means positioned above a portion of said first conveyor means for cooperating therewith to receive the metered groups and for orienting the slats in each group so that the long dimension of each slat is positioned normally to said in-line path and for preventing the slats in each from buckling as they pass thereunder, third conveyor means positioned in-line with and downstream from said first and second conveyor means, said second conveyor means terminating upstream from the termination point of said first conveyor thereby defining a discharge point where the group of metered and oriented slats emerge from their passage between said first and second conveyor means, said third conveyor means including slat receiving means at least part of which is positioned outboard of said discharge point and said first conveyor means for intersecting and transferring the groups of slats from said first conveyor means to said third conveyor means in their oriented condition as the groups are discharged from between said first and second conveyor means and drive means for driving said system wherein said second and third conveyor means operate at a first rate while said first conveyor means operates at a second faster rate.

4,310,089

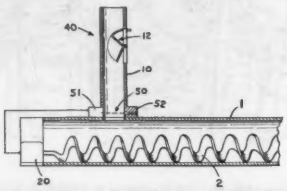
CONVEYOR FOR TRANSPORT OF BAGS OF REFUSE

Leif S. Bondeson, Malmo, and Stig F. Edner, Vebergod, both of Sweden, assignors to Platmanufaktur AB, Malmo, Sweden

Continuation-in-part of Ser. No. 105,034, Dec. 19, 1979, which is a continuation of Ser. No. 902,038, May 2, 1978, abandoned.
This application Apr. 4, 1980, Ser. No. 137,373
Claims priority, application Sweden, May 10, 1977, 7705409
Int. Cl.³ B65G 47/02
U.S. Cl. 198—530 14 Claims

1. A conveyor for transport of bags of refuse comprising a feed tube through which the bags of refuse are transported from one end to the other, supply means for introducing bags

of refuse into said feed tube and a feed screw in said tube for drivingly conveying the bags of refuse through said tube, said feed screw comprising a helix forming successive spaced flanges, the pitch of the helix being such that the space between successive flanges will accommodate a bag of refuse of predetermined maximum overall size U, said feed tube having at least a lower portion of rounded shape in cross-section with a major vertical axis, said feed screw being eccentrically supported in said feed tube for rotation therein such that the outer circumference of said feed screw is in tangential contact with the inner circumference of said feed tube at the bottom thereof, means for rotating said feed screw which causes the feed screw to ride up along the inner circumference of said feed tube, said supply means including inlet means having a size related to the size of the feed tube and the size of the feed screw for limiting the size of the bags of refuse so that only bags of refuse less than said predetermined maximum size U will enter said feed



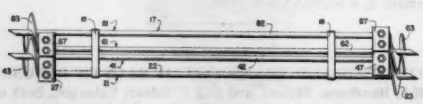
tube and pass substantially undamaged therethrough, said supply means comprising a chute extending vertically upwards from said feed tube, said inlet means comprising a hopper supported for pivotable movement with respect to said chute, said hopper having a loading position partially outside said chute for receiving a refuse bag and a discharge position within said chute in which the refuse bag is freely dropped into the chute for passage to said feed tube, said hopper comprising first and second plates connected to one another in the vicinity of the axis of pivotable movement of the hopper, said plates forming an angle therebetween to define a space for a bag of refuse, lateral plates secured to said first and second plates to enclose said space laterally and a separate and independent door secured for pivotal movement about said axis at an angle different from said plates and outside said space, said space facing generally upwards outside said chute in said loading position and generally downwards in said chute in said discharge position to drop the bag of refuse into said chute.

4,310,090

NESTABLE TIE DOWN ANCHOR AND PACKAGE THEREOF

Charles J. Mackarvich, 8511 NW. 61st St., Miami, Fla. 33166

Filed Sep. 2, 1980, Ser. No. 183,447
Int. Cl.³ B65D *85/20, 85/62, 71/00*
U.S. Cl. 206—443 **38 Claims**



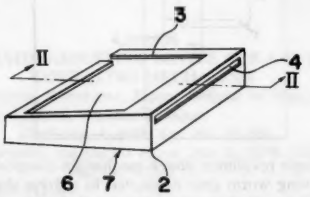
1. A package of tie down anchors comprising a plurality of individual tie down anchors each comprising shaft means, auger blade means secured to said shaft means adjacent one end thereof and head means secured to the other end of said shaft means, said anchors being assembled in interlocking, nesting relation alongside each other with the shaft means of each anchor adjacent the auger blade means thereof being received in a recess formed in the head means of an adjacent anchor, and strap means for holding said anchors in position with respect to each other.

4,310,091

FILM-PACKET TO BE ADAPTABLE FOR PICTURE STAND

Yoshio Hara, Minami-ashigara; Tomoyuki Takahashi, Odawara, and Yukihiro Sugimoto, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 11, 1979, Ser. No. 102,519
Claims priority, application Japan, Dec. 11, 1978, 53-170556[U]
Int. Cl.³ B65D *5/52*
U.S. Cl. 206—455 **4 Claims**



1. A film-packet adaptable for a picture stand, said film-packet accommodating a predetermined number of film-units, each to be used as an image carrying member for a camera based on the diffusion transfer process, said film units including a pod-portion for an agent associated with the diffusion transfer process on a heading portion of the unit, and a space-portion in use for storing an excess amount of the agent on a trailing portion of the unit to opposite sides of the center of each unit, said film packet comprising:

a box-like case for accommodating said film-units therein, said box-like case having a front side, a rear side and opposed lateral sides,

a window-portion within said front side defining a window for exposure and constituting a substantial portion of said front side of said box-like case,

a slit-shaped aperture provided on one lateral side of said box-like case adjacent said window for permitting each of said film-units to be withdrawn therethrough,

a sheet-like article covering member of a length and width closing off said window and slidably positioned between said film-units and said front wall for shielding said window so as to prevent said film-units from being exposed, and being slidably removable from said case through said slit, and

a spring biased backing plate within said box-like case and between said rear wall and said film-units for causing said film-units to be urged towards said covering member,

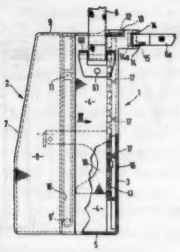
the improvement wherein said box-like case includes an integral recess within said rear wall projecting from said rear wall into the interior of said box-like case at an approximately central location and within a dead space intermediate of the film-unit pod-portions and said space portions and wherein one end of said covering member is dimensioned and configured so as to strongly frictionally fit in said rear wall recess after said covering member is removed from said case to function as a supporting leg to permit said film-packet box-like case and said covering member to constitute a picture stand for a developed film from one of said film-units.

4,310,092

PHOTOGRAPHY SHOULDER BAG WITH A PIVOTAL LID

Christoph Muller, Kleiner Muristalden 26, CH-3006 Bern, Switzerland

Filed Aug. 23, 1979, Ser. No. 69,202
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1978, 2838289
Int. Cl.³ B65D *85/00*
U.S. Cl. 206—578 16 Claims



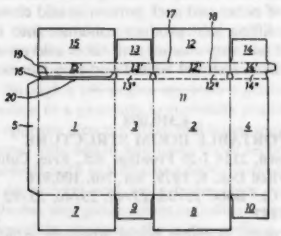
1. A photography case construction comprising plurality of wall portions defining the periphery of said case and an enclosed case interior for receiving a plurality of discrete photographic items, an inner mounting wall of said case interior having apertures therein; securing means received in the apertures of said mounting wall for releasably securing a photographic item in place on said mounting wall; each of said securing means comprising a pin having an enlarged head, a shank portion extending therefrom adapted to traverse the thickness of said apertured wall, and a terminal eccentric arm oppositely disposed to said enlarged head projecting outwardly from said shank portion; said securing means head and eccentric arm being adapted to engage opposite surfaces defining an aperture through which said pin shank portion extends.

4,310,093

FOLDING BOX AND BLANK FOR FABRICATING THE SAME

Karl Manser, Zurich, Switzerland, assignor to Migros Genossenschafts-Bund, Zurich, Switzerland

Filed Aug. 21, 1979, Ser. No. 68,387
Claims priority, application Switzerland, Aug. 21, 1978, 8847/78
Int. Cl.³ B65D *5/08, 5/54*
U.S. Cl. 206—624 5 Claims



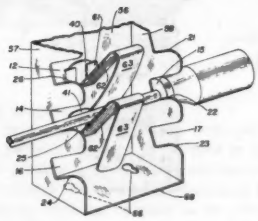
1. A blank for a box, said blank being formed of foldable sheet material, and is divided by longitudinal fold lines to define two face sides and two end sides in alternating relation, transverse fold and tear lines at one end of said sides and, in cooperation with extensions of said longitudinal fold lines and cutouts aligned with said longitudinal fold line extensions, defining in longitudinal alignment with each end side and one of said face sides a connecting flap, a cover side panel and a cover flap, and in alignment with the other of said face sides a cover side panel and a cover panel, there being a transverse cutout between said other face side and the respective one of said cover side panels, and all of said cover side panels being of the same dimension longitudinally of said blank.

4,310,094

TOOL RACK

John E. Hotchkiss, Jr., 451 Cedar Hill Dr., San Rafael, Calif. 94903

Filed Aug. 13, 1979, Ser. No. 66,068
Int. Cl.³ A47F *5/08*
U.S. Cl. 211—60 T 5 Claims



1. A tool holder having spaced apart side walls having normally disposed front edges and formed with aligned tool receiving recesses opening to said front edges and dimensioned for receipt of a tool therein, said recesses having walls for support of a tool thereon in spanning relation to said side walls; and

a U-shaped spring comprising opposed elongated legs, a U-shaped connecting portion, and opposite leg ends mounted medially between said side walls with said legs having a normal front and rear position, said opposite end of said rear leg being secured to said holder for free-standing support and resilient displacement of said legs, said front leg being juxtaposed to the plane of said recess walls for engagement of a mid-portion of said tool on insertion thereof into said recesses and to be resiliently deflected by said tool away from said plane to thereby resiliently urge said tool against said recess wall in a three-point support.

4,310,095

DISPLAY UNIT FOR DISPLAYING CONFECTIONARY ITEMS HAVING STICKS

Enrique B. Fontladosa, Paris St. 184, Barcelona, Spain

Filed Mar. 31, 1980, Ser. No. 136,457
Claims priority, application Spain, Mar. 30, 1979, 242.396
Int. Cl.³ A47B *97/08*
U.S. Cl. 211—60 A 8 Claims

1. A display unit for displaying confectionary items having sticks, such as lollipops, said display unit comprising:

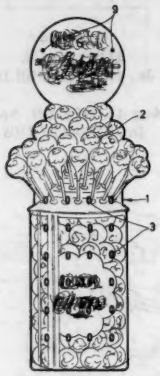
a planar display member formed of a rigid material and having front and rear sides;

a support member formed by a planar element folded along a pair of parallel fold lines to form a pair of parallel support legs extending substantially transverse to the plane of said element, said element having forward therein, adjacent each said fold line, cuts forming tabs such that when said legs are folded along said fold lines said tabs extend outwardly from said element in directions opposite to the directions of said legs;

an attachment and reinforcing member having a front side attached to said rear side of said display member and a rear side having forward therein slots positioned to receive said tabs of said support member, whereby said support member supports said attachment and reinforcing

member, and said display member attached thereto, in an upright position;

said display member having extending therethrough a plurality of orifices arranged in columns, each said orifice being of a size to receive therein a stick of a confectionary item; and



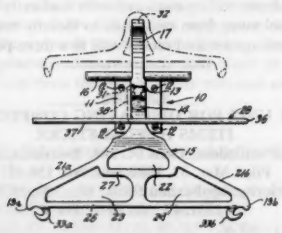
said front side of said attachment and reinforcing member having provided therein a plurality of elongated channels, each said channel being positioned to confront a respective said column of said orifices, whereby sticks extended through said orifices will abut against and be retained by walls of respective said channels.

4,310,096

WALL CLOTHES HANGER

Heinrich Kohlhepp, Rathausstrasse 14, 6433 Philippsthal, Werra, Fed. Rep. of Germany

Filed May 1, 1980, Ser. No. 145,849
Int. Cl.³ A47F *7/06, 7/19*
U.S. Cl. 211—88 **4 Claims**



1. A wall clothes hanger comprising:

a rear mounting bracket for fixation to a wall having a central recess therein,

an upper shelf portion mounted to the top of the bracket and extending outwardly therefrom,

a member extending upwardly in a curve from beneath the shelf to accommodate hats and the like and having a rear portion extending beneath the shelf to the wall bracket and including a slot therein,

a pants hanger comprising a metal bar extending outwardly from the wall bracket and having an end portion extending substantially parallel to said wall, and

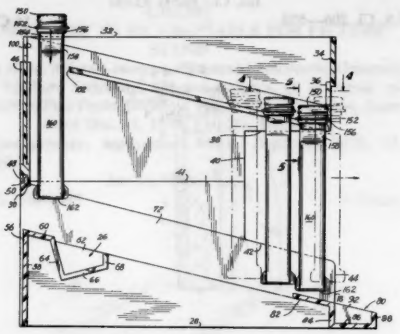
a universal hanger having an upwardly projecting portion for engagement with the slot in the upper member within the recess in the wall bracket.

4,310,097

GRAVITY FEED COMBINED DISPLAY AND STORAGE UNIT

Milton J. Merl, New City, N.Y., assignor to Marlboro Marketing, Inc., New York, N.Y.

Filed Aug. 5, 1980, Ser. No. 175,558
Int. Cl.³ A47F *1/00*
U.S. Cl. 211—49 D **6 Claims**



1. A gravity feed combined display and storage unit for product containers having upper necks with closure means which comprises:

said unit having support means;

at least two divider members secured to and sloping downwardly towards the display portion of said support means;

each divider member having a shoulder extending outwardly towards the shoulder of said other divider member and spaced therefrom, forming a channel whose width is greater than the width of the container neck, but less than the greatest diameter of either a portion of the neck or closure means;

the upper portion of the divider members and the adjacent portion of said unit having means to allow placement of containers on said shoulders, said shoulders always positioned at a height sufficient so that said product container always hangs free and clear; and

the lower portion of said divider members terminating at bottle stop means secured thereto, the side edges of said stop means forming a stop channel, said stop channel being a continuation of and extending in a substantially acute upwardly direction from said channel, the height of said stop channel being at least slightly less than the height of the neck between the points of greatest diameter associated with the neck or closure means, an upper portion of said stop channel having a width greater than the greatest diameter of either said neck portion or said closure means whereby, lifting said product container into the upper portion of said stop channel will allow said product to be removed from restraint behind said stop means.

4,310,098

PORTABLE BOOM STRUCTURE

Larry E. Dirksen, 2114 I-25 Frontage Rd., Erie, Colo. 80516

Filed Dec. 6, 1979, Ser. No. 100,916
Int. Cl.³ B66C *23/38, 23/42, 23/46, 23/82*
U.S. Cl. 212—187 **11 Claims**

1. An improved, portable boom structure which can be towed by a vehicle to a work sight, said boom structure comprising:

a boom support member mounted on wheels to facilitate towing of the boom structure;

an elongated frame having one end connected to said boom support member and extending in a generally horizontal direction for towing the boom structure and having means at the opposite end to connect it to a vehicle;

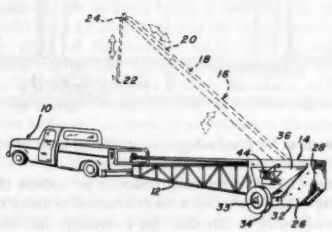
a telescopic boom having an outer end and an inner end and being pivotally connected adjacent said inner end to said boom support member above the axis of the wheels for movement above said frame through a 180 degree arc from a generally horizontal position to a horizontal position in the opposite direction from said boom support member;

cable means connected to said boom support member and extendable from said outer end of said telescopic boom for engaging a load to be lifted; and

first means mounted on said boom support member and connected to said telescopic boom to pivot said telescopic boom about said boom support member, said first means including a first winch upper pulley set having a plurality of pulleys mounted adjacent said inner end of said telescopic boom and a first winch lower pulley set having a plurality of pulleys mounted on said boom support member below said first winch upper pulley set, said first winch upper pulley set being arranged to pass over said first winch lower pulley set as said telescopic boom is moved through the 180 degree arc.

9. An improved portable boom structure supportable on wheels and connectable to a frame to be towed by a vehicle, said boom structure comprising:

a boom support member;



an outer boom having a generally square cross-section and a first interior corner, a second interior corner, and a third interior corner;

an inner boom having a generally circular cross-section with an outer diameter just sufficiently less than the inside dimension of said outside outer boom to be slidably received therein, said outer boom and said inner boom together forming a telescopic boom pivotally mounted on said boom support member for movement above said frame through a 180 degree arc from a generally horizontal position to a generally horizontally position extending in the opposite direction from said boom support member;

guide means attached to said inner boom section for sliding engagement with at least one interior corner of said outer boom to prevent said inner boom from turning in said outer boom, said guide means including a generally circular face plate engaging the outer surface of said inner boom and an ear portion connected to said face plate and extending adjacent an interior corner of said outer boom other than said first and second interior corners;

a cable extendable from an end of said telescopic boom for lifting a load; and

first means mounted on said boom support member and connected to said telescopic boom to pivot said telescopic boom about said boom support member.

4,310,099

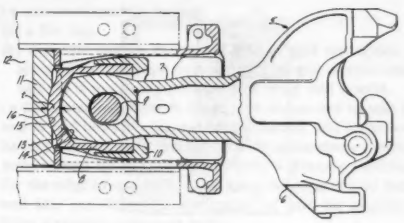
ROTARY CONNECTOR

Richard M. Hanula, Lyndhurst, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Apr. 14, 1980, Ser. No. 139,813

Int. Cl.³ B61G *9/00*

U.S. Cl. 213—62 A **7 Claims**



1. A rotary coupler, comprising:

(a) a yoke having an opening in the front end thereof;

(b) a front follower disposed in the yoke in spaced relation from the opening in the front end and having a concavity recessed therein and facing the opening in the front end;

(c) a connector rotatably mounted in the yoke between the opening in the front end and the front follower, the connector having a butt end which is matingly configured for seating engagement in the concavity of the front follower;

(d) a coupler head having a shank extending therefrom through the opening in the front end of the yoke into the connector; and

(e) means for mounting the coupler shank to the connector for unitary rotation therewith.

4,310,100

CONTAINER CAP HAVING A PEELABLE LINER

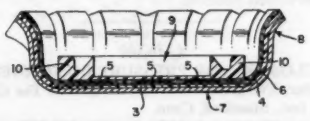
Go Kunimoto, Fujisawa; Isao Ichinose, Hiratsuka; Noboru Suzuki, Fujisawa, and Fumio Mori, Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Tokyo, Japan

Filed Nov. 2, 1979, Ser. No. 90,627

Claims priority, application Japan, Nov. 2, 1978, 53-150373[U]

Int. Cl.³ B65D *53/00*

U.S. Cl. 215—228 **10 Claims**

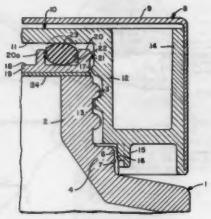


1. A container cap comprising a metal shell, a thermoplastic resin peelable liner on the inside of said shell, a peelable adhesive layer having a diameter less than that of said metal shell and larger than that of a peelable portion of the liner, and an epoxy resin coating layer secured to said liner overlying the inside surface of said metal shell and said peelable adhesive layer to form an easily peelable adhesive interface with said peelable adhesive layer whereby pressing the periphery of the liner overlying said inner face will cause a break in the epoxy resin layer to allow easy peeling of the liner from the shell at the interface.

4,310,101
COMBINED BOTTLE AND SCREW CAP ASSEMBLY

Shigeo Sekine, Tokyo, Japan, assignor to Max Factor & Company, Hollywood, Calif.

Filed Feb. 21, 1980, Ser. No. 123,342
Int. Cl.[3] B65D *41/04, 53/04*
U.S. Cl. 215—330 18 Claims



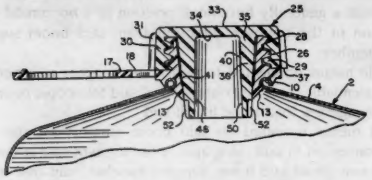
1. A container assembly comprising:
(a) a bottle including a top open end and a cylindrical top end section extending downwardly from said open end, said top end section being provided with external threads;
(b) a cap arrangement including means defining a cylindrical innermost surface containing internal threads which are designed to cooperate with said external threads for screwing down the cap arrangement around the top end section of said bottle for closing its open end and an underside extending across and above said innermost surface;
(c) means for locating said cap arrangement in a predetermined, closed position along the length of the top section of said bottle, said locating means including means forming part of said cap arrangement for providing an internal, radially inwardly extending rib located below said internal threads and means forming part of said bottle for providing an external recess below said external threads so as to receive said rib as said cap arrangement is screwed down into said predetermined closed position, said recess providing means including a first projection extending radially outwardly from and formed on the top section of said bottle below said external threads and a second projection extending radially outwardly from and formed on the top section of said bottle in a position past and extending further out than said first projection in the screw closing direction of rotational movement of said cap arrangement, whereby said recess is defined between said projections; and
(d) means for providing a seal around the open end of said bottle between the latter and the underside of said cap arrangement when said cap arrangement is in said predetermined closed position and even if said cap arrangement is in a position around the top end section of said bottle predetermined distances above or below said predetermined closed position.

4,310,102
CLOSURE FOR PRESSURE CONTAINER

John Walter, Evergreen Park, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Apr. 3, 1978, Ser. No. 892,525
Int. Cl.[3] B65D *41/04*
U.S. Cl. 220—288 11 Claims

1. A closure for a pour opening in a transaxially extending wall of a container comprising:
a flexible plastic neck member extending into the container transversely of said wall through said opening and having axially spaced inner and outer sealing means embracing said wall and abutting the inner and outer sides thereof about said opening, and
a cap threaded onto said neck member and having plug means extending into a pouring bore in said neck member and having a wedge fit with a reduced portion of said member for expanding a contiguous portion of the same and also concurrently deflecting said sealing means into tight sealing engagement with the marginal edge of said

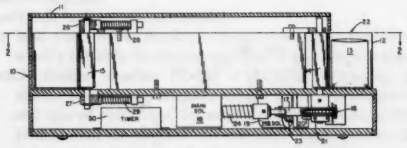


wall defining said opening and said sealing means being formed and arranged to swing axially of said wall attendant to wedging of said plug means within said reduced portion of the neck member.

4,310,103
MEDICATION DISPENSER

Philip C. Reilly, Jr., 255 Hill St., Whitinsville, Mass. 01588, and Charles D. Battersby, Rawson Heights, Webster, Mass. 01570

Filed May 9, 1980, Ser. No. 148,207
Int. Cl.[3] B65B *59/00*
U.S. Cl. 221—15 3 Claims



1. Apparatus for presenting consecutively each of a plurality of containers including the combination of:
a plurality of said containers linked in an endless chain;
stepping means including a timer adapted to move the chain intermittently to advance the containers successively to and from a fixed presentation position; and
a housing completely enclosing all of said containers except for the container in said fixed presentation position, said housing including exit and entrance openings adjacent said fixed position, said containers being adapted to close substantially said exit and entrance openings after a container has advanced to and from said fixed presentation position;
wherein the stepping means advances the containers at the end of consecutive alternating first and second time intervals, the containers and openings being spaced so that during each said first interval a container is located in said fixed presentation position and during each said second interval no container is located in said fixed presentation position.

4,310,104
VACUUM BOTTLE WITH BELLOWS PUMP

Toyohiko Takatsuki, Izumi, Japan, assignor to Zojirushi Vacuum Bottle Co., Ltd., Osaka, Japan

Filed Sep. 3, 1980, Ser. No. 183,738
Claims priority, application Japan, Sep. 4, 1979, 54-122797; Sep. 26, 1979, 54-133764
Int. Cl.[3] F04B *43/02;* B67D *5/54;* A47J *41/02*
U.S. Cl. 222—131 4 Claims

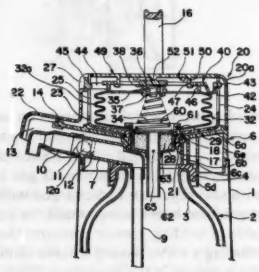
1. A vacuum bottle with a bellows pump comprising
an inner bottle of a vacuum-insulated double wall construction,
an outer container comprising a cylindrical body provided

with a bottom, a shoulder body mounted on the top of the cylindrical body and provided with a liquid supply line to which a downwardly extending pumping tube and a pouring tube are connected, and a lid body removably mounted on the shoulder body, and

a bellows pump arranged in the lid body and adapted to feed air into the interior of the inner bottle to increase the internal pressure therein, thereby pouring the liquid in the inner bottle therefrom through the pumping tube and pouring tube,

said inner bottle being arranged in a space formed between said body and the shoulder body,

said bellows pump comprising a bellows body integrally molded with a bottom having an air outlet, a return spring



arranged in the bellows body, a bellows cap movably mounted in an air inlet formed at the central portion of an upper plate of the bellows body, and an externally threaded cylindrical fixing member having an upper flange and being provided with an air tube at its bottom,

said fixing member being inserted in the air outlet of the bellows body and screwed in an internally threaded bore provided in the bottom of the lid body so as to place an internal edge of the bottom of the bellows body forming the air outlet between the upper flange of the fixing member and the bottom of the lid body, thereby incorporating the bellows pump as an integral part of the lid body, the return spring being placed between said bellows cap and the fixing member.

4,310,105

CHILD-RESISTANT DISPENSING CLOSURE

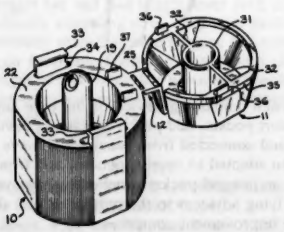
Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Apr. 24, 1980, Ser. No. 139,840

The portion of the term of this patent subsequent to Dec. 2, 1997, has been disclaimed.

Int. Cl.³ B65D *47/08*

U.S. Cl. 222—153 **6 Claims**



6. A child-resistant package for liquid materials, said package comprising, in combination,

(a) a container having a threaded neck and a series of one-way ratchet teeth on said neck,

(b) a closure for said container, said closure consisting of

(1) a body comprising

(a) an annular skirt having mating threads and cooperating ratchet teeth on its inner surface,

(b) a dispensing nozzle,

(c) flexible annular webs integrally connecting said nozzle to said skirt and closing said container neck except for said nozzle,

(2) a saucer-shaped lid having

(a) a flat top,

(b) a nozzle cap on the under side of said top which is adapted to telescope over the end of said nozzle when said lid is in closing position overlying said nozzle,

(3) a double-acting, flexible hinge web connected to said lid and to said body at adjacent edges thereof, said hinge web having a length sufficient for providing translatory movement of said lid relative to said body a distance sufficient for the edge of said lid to over-hang the edge of said body and also providing for movement of said lid angularly from a position atop said body,

(4) catch means on said body and said lid which are adapted to engage for preventing such angular movement when said lid is in closing position, whereby said lid, first, must be moved laterally for protruding the edge of said lid beyond the edge of said body and, second, swung angularly on said hinge web for removing said nozzle cap from said nozzle.

4,310,106

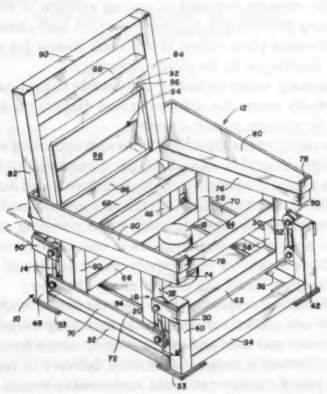
SIDE OUTLET PORTABLE CONTAINER UNLOADER

Eugene Greck, Westfield; Eugene A. Wahl, Glen Ridge, and Richard C. Wahl, Verona, all of N.J., assignors to Vibra Screw, Incorporated, Totowa, N.J.

Filed Nov. 30, 1979, Ser. No. 99,104

Int. Cl.³ B65G *27/20*

U.S. Cl. 222—161 **19 Claims**



1. An unloader for portable containers comprising:

vibratory support means for receiving and supporting a portable container in a discharge position;

fixed support means;

vibratory means affixed to said vibratory support means for vibrating said vibratory support means and the portable container thereon relative to said fixed support means; and

vibration isolation suspension means under tension interconnecting said vibratory support means and said fixed support means for isolating said fixed support means from the vibration of said vibratory support means and limiting the vibratory motion of said vibratory support means to substantially horizontal motion.

4,310,107

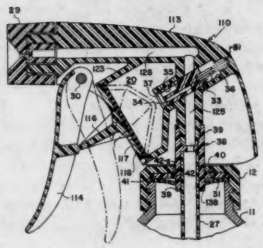
MANUALLY OPERATED, TRIGGER ACTUATED DIAPHRAGM PUMP DISPENSER

Walter H. Wesner, Ft. Lauderdale, Fla., assignor to The AFA Corporation, Hialeah, Fla.

Continuation of Ser. No. 796,116, May 11, 1977, abandoned, which is a continuation of Ser. No. 626,818, Oct. 29, 1975, abandoned. This application Feb. 28, 1980, Ser. No. 125,611

Int. Cl.[3] B05B *9/043*

U.S. Cl. 222—214 6 Claims



1. A manually operated dispenser adapted to be attached to a liquid container comprising:

(a) component retaining body means having an open walled cavity defining a pump chamber;

(b) a resiliently deformable pump diaphragm having an elastic memory retained in sealing relation in the cavity opening providing a sealable cover for said chamber;

(c) perforated plate means in the body means for retaining said diaphragm in the cavity opening;

(d) operating means including a pivotable trigger carried on said body means for deforming said diaphragm and varying the volume of said chamber;

(e) extension means associated with said operating means by a hinge connected to said trigger extending through said plate means in operative engagement with said diaphragm for deforming said diaphragm from a normal, undeformed nonpumping condition to a deformed, pumping condition;

(f) inlet and outlet conduit means in said component retaining body means for respectively delivering liquid into and discharging liquid out of said pump chamber;

(g) a shiftable, composite valve element in said body means;

(h) inlet and outlet valve means in said body means associated with said inlet and outlet conduit means respectively, said inlet valve means controlling delivery of liquid into said pump chamber and said outlet valve means controlling discharge of liquid from said pump chamber, said inlet and outlet valve means included in said composite valve element, said element being shiftable between at least two positions and having at least two flow passages, one of said passages registering with and providing liquid communication between said inlet conduit means and said pump chamber when said element is shifted to one of said element positions and another of said passages registering with and providing liquid communication between said outlet conduit means and said pump chamber when said element is shifted to another of said element positions; and,

(i) discharge means communicating with said outlet conduit means for dispensing liquid pumped by said pump diaphragm.

4,310,108

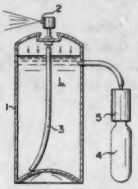
AEROSOL SPRAYER WITH PRESSURE RESERVOIR

Shimesu Motoyama, Asaka; Shuri Yamada; Kaoru Kurita, both of Tokyo, and Akira Iwasaki, Tanashi, all of Japan, assignors to Freund Industrial Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 913,923, Jun. 8, 1978, abandoned. This application Aug. 8, 1980, Ser. No. 176,448

Int. Cl.[3] B65D *83/00*

U.S. Cl. 222—396 4 Claims



1. An aerosol sprayer which comprises an aerosol can having a spray nozzle equipped on one end thereof, a pressure regulator connected with said can for providing a constant pressure in said can, and a compressed gas bomb which is connected with said regulator and charged with a highly compressed inert gas, said bomb being smaller in volume than said can and capable of holding greater pressures than said can, said regulator including a valve having a valve element exposed on one side to the pressure in the bomb in a direction to close the valve, a chamber on a second side of the valve element, said chamber partially defined by a partition member, said partition member being spring-biased against said valve in a direction to open said valve element, said partition member exposed on the side opposite said chamber to the interior of the can, and a passageway between said secondary chamber and the interior of the can and, a second valve means in said chamber for opening and closing said passageway in response to pressure changes in the can.

4,310,109

PENCIL HOLDER

Francis S. Coyle, 185 Plateau Ave., Pocatello, Id. 83201

Filed Feb. 2, 1981, Ser. No. 230,613

Int. Cl.[3] A45C *11/04;* B43K *25/00*

U.S. Cl. 224—230 8 Claims

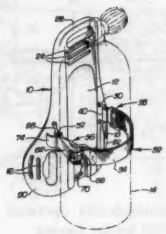
1. In a pencil containing device of the type adapted to fit inside of a shirt pocket, said pencil containing device having a back panel and connected front panel which have an opening therebetween adapted to receive pencils, said front panel further having an integral pocket panel extending over said shirt pocket and lying adjacent to the outside of said shirt pocket, wherein the improvement comprises:

spring means interconnecting said back panel and said pocket panel for biasing said back panel toward said pocket panel, whereby said pencil holding device releasably fastens to said shirt pocket and positively retains pencils inserted in said opening.

4,310,110
SCUBA TANK HARNESS

James T. Dexter, Fullerton, Calif., assignor to Under Sea Industries, Inc., Compton, Calif.

Filed Jan. 21, 1980, Ser. No. 113,960
Int. Cl.[3] A44B *11/00*; A45F *3/08*
U.S. Cl. 224—246 2 Claims



1. A harness for a scuba diver to enable the diver to carry a generally cylindrical tank of compressed air:

(a) a relatively rigid back plate having protrusions for it to be carried at the back of the diver;

(b) said back plate having a seat formed therein for the air tank;

(c) a pair of brackets on opposite sides of the seat;

(d) a flexible webbing assembly cooperable at opposite ends with said brackets to firmly hold said air tank in its seat;

(e) said webbing assembly including a web made of flexible substantially inelastic fabric material;

(f) said webbing assembly including a first hook detachably cooperable with one of said brackets, said first hook having means forming a buckle bar around which one end of said web is wound and returned along the inside of the web;

(g) flexible hook and mesh fastener elements attached, respectively, to the returned end of said web and the inside facing part of said web for supplementing the holding power of the buckle bar whereby the operative length of said web is positively determined;

(h) said webbing assembly also including a rigid loop fixedly carried at the opposite end of the web;

(i) said webbing assembly also including a second hook detachably cooperable with the other of said brackets, said second hook comprising a toggle bar;

(j) said webbing assembly also including a toggle lever pivotally mounted on the outer side of said toggle bar for movement about an axis located remote from the corresponding bracket, said toggle lever upon angular movement to an open position away from said toggle bar being movable through said rigid loop, said toggle bar having recess means to engage and pick up said rigid loop for toggle connection to said toggle bar upon movement of said toggle lever to closed position;

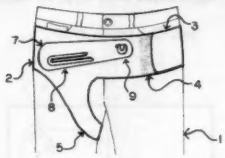
(k) said toggle bar and said toggle lever each comprising a longitudinally extending strip, each strip having a pair of longitudinally extending side flanges, the side flanges of the toggle lever overlying and substantially shielding the side flanges of said toggle bar when said toggle lever is in closed position, said recess means being formed in the side flanges of said toggle lever.

4,310,111
DEVICES FOR THE SUPPORT OF STRINGED MUSICAL INSTRUMENTS

Rachael E. Brent, P.O. Box 884, San Bruno, Calif. 94066

Filed Jun. 25, 1979, Ser. No. 51,638
Int. Cl.[3] G10D *3/00*
U.S. Cl. 224—252 8 Claims

1. Apparatus for supporting a stringed musical instrument having a main body comprising a band member adapted to be worn around the waist of the player; a support member adapted to be attached to the rear portion of the body of the musical instrument; and means at a pair of locations on said members for releasably coupling the support member to the bank member, said coupling means including a socket and a projecting element at each of said locations, respectively, each

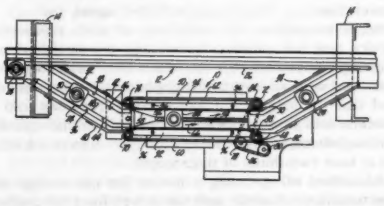


projecting element being removably received within the corresponding socket, the projecting element at one of the locations being shiftably mounted on one of the members for movement relative to the other projecting element to permit the support member to pivot relative to the band member about the other location.

4,310,112
APPARATUS AND METHOD FOR REMOVAL OF FLASH FROM CONTAINERS

Jerry L. Huss, Tecumseh, Mich., assignor to Hoover Universal, Inc., Saline, Mich.

Filed Jul. 7, 1980, Ser. No. 166,242
Int. Cl.[3] B26F *3/02*
U.S. Cl. 225—3 9 Claims

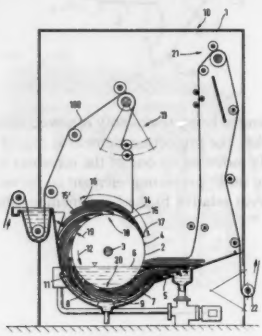


1. Apparatus for removal of flash from containers formed of thermoplastic material following blow molding thereof, comprising a conveyor on which the containers can be advanced continuously in series, and a deflashing mechanism that exerts a tensile force between each container and its flash to cause a separation thereof as the containers are advanced on the conveyor, characterized in that said conveyor has a container guide means on one side of which said containers advance, said guide means having a slot through which the flash of each advancing container extends to the other side of the guide means, said deflashing mechanism includes elongated counter rotation rollers located adjacent to said slot and extend longitudinally thereof on said other side of the guide means for gripping and pulling the extending flash of each advancing container between the rollers, and roller drive means are operatively connected for counter rotating said rollers as said containers are advanced, said guide means and said counter rotation rollers thereby cooperating to exert said tensile force between each container and its flash.

4,310,113
APPARATUS AND METHOD FOR STORAGE AND REACTION TREATMENT OF TEXTILE MATERIAL IN WEB FORM

Johannes Kutz, Tönisvorst, and Manfred Moser, Krefeld-Fischeln, both of Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Mar. 20, 1980, Ser. No. 132,105
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1979, 2931990
Int. Cl.[3] D06B *3/10*
U.S. Cl. 226—4 10 Claims



1. A device for the storage and reaction treatment of textile material is web form for continuous passage comprising:

(a) a cylinder;

(b) a pleating device for pleating the textile material in several layers with folds parallel to the axis of the cylinder onto the top of the cylinder;

(c) a transporting device for circumferentially transporting the textile material deposited on said cylinder;

(d) a depositing device arranged underneath the cylinder;

(e) a pulling off device for pulling the textile material off at a point following the lower crest of the cylinder in the travel direction, dissolving the folded layers; and

(f) means controlling the velocities of said transporting device and said pleating device and the stroke of said pleating device such that the folded layers extend at least one-third on both sides of the upper crests of the cylinder and that the length of a folded layer from one fold to another fold is one-quarter to one-half of the cylinder circumference, and that the folded layers cover each other on at least two-thirds of their length.

10. A method of operating a device for the storage and reaction treatment of textile material in web form for continuous passage which includes:

(a) a cylinder;

(b) a pleating device for pleating the textile material in several layers with folds parallel to the axis of the cylinder onto the top of the cylinder;

(c) a transporting device for circumferentially transporting the textile material deposited on said cylinder;

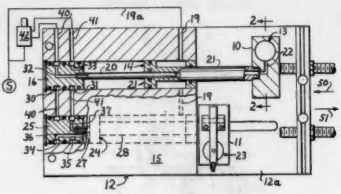
(d) a depositing device arranged underneath the cylinder; and

(e) a pulling off device for pulling the textile material off at a point following the lower crest of the cylinder in the travel direction, dissolving the folded layers comprising: controlling the velocities of said transporting device and said pleating device and the stroke of said pleating device such that the folded layers extend at least one-third on both sides of the upper crests of the cylinder and that the length of a folded layer from one fold to another fold is one-quarter to one-half of the cylinder circumference, and that the folded layers cover each other on at least two-thirds of their length.

4,310,114
CONTROL ARRANGEMENT FOR DUAL SLIDE PNEUMATIC FEEDERS

Albert W. Scribner, 6 Country Club Rd., Darien, Conn. 06820

Filed Jan. 29, 1980, Ser. No. 116,548
Int. Cl.[3] B65H *17/36*
U.S. Cl. 226—162 15 Claims



1. A dual slide pneumatically operated feeder for punch presses and the like; said feeder having

a frame;

first and second feed slides reciprocally mounted on said frame;

stock gripping means carried by each of said feed slides;

a first fluid motor means carried by said first slide for actuating the stock gripping means carried by said first feed slide;

a second fluid motor means carried by said frame for reciprocally actuating said first feed slide;

a third fluid motor means carried by said second feed slide for actuating the stock gripping means carried by said second feed slide;

a fourth fluid motor means carried by said frame for reciprocally actuating said second feed slide; and

control means for said first, second, third and fourth fluid motor means;

said control means comprising

valve means adapted to be operated in response to the cyclic operation of said punch press and having two output control lines, one of said control lines being operatively coupled to said first and fourth fluid motor means and the other of said control lines being operatively coupled to said second and third fluid motor means;

said valve means being adapted when in one operative condition thereof to pressurize said one control line and to exhaust said other control line so as to cause said first slide to partake of a feed stroke and said second slide to partake of an index stroke, and adapted when in a second operative condition thereof to exhaust said one line and pressurize said other line so as to cause said second feed slide to partake of a feed stroke and said first feed slide to partake of an index stroke, whereby said feed slides may alternately produce a rapid series of stock feed strikes in response to the repeated operation of said valve means.

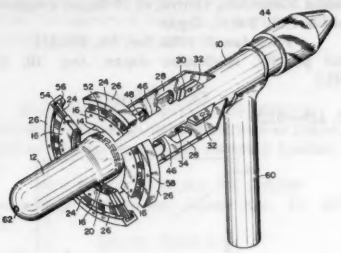
4,310,115
APPARATUS FOR SUTURING A RECTUM

Noboru Inoue, Tokyo, Japan, assignor to Takasago Medical Industry Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1979, Ser. No. 99,506
Claims priority, application Japan, Dec. 9, 1978, 53-152875
Int. Cl.[3] A61B *17/04*
U.S. Cl. 227—19 9 Claims

1. An apparatus for suturing a doubled rectum which comprises a cylindrical hollow supporting member having at its one end a nozzle tip of a size and length to be inserted into the rectum, said nozzle tip having at its front end an aperture for washing the inside of the hollow supporting member and being provided with a plurality of needle opposing seats located behind the nozzle tip and on the circumference of the supporting member, four suturing members surrounding the needle opposing seats and annularly spaced apart from each other, said suturing members each having therein a plurality of needle

receiving spaces extending radially and a plurality of pushing members slidably inserted into the needle receiving spaces for pushing needles toward the needle opposing seats, four actuating bars each being pivoted to the supporting member and connected at its one end to a said suturing member for allowing radial movement thereof in relation to the supporting member,



an adjusting member provided at the other end of the supporting member for radially moving the actuating bars through a mechanism arranged within the supporting member, and four operating members each tangentially slidably receiving the outer ends of a said plurality of pushing members to move said pushing members radially.

4,310,116

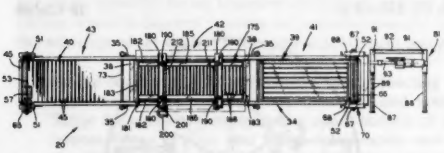
METHOD FOR PRODUCING SOLAR COLLECTOR PANELS

Anthony R. Shaw, Waterville; Wallace F. Krueger, Toledo, and Lloyd E. Bastian, Perrysburg, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Division of Ser. No. 950,511, Oct. 11, 1978, Pat. No. 4,231,505. This application Mar. 4, 1980, Ser. No. 127,169

Int. Cl.³ B23K *3/06*

U.S. Cl. 228—183 **3 Claims**



1. A method of fabricating solar collector panels comprising: providing a thermally conductive, heat absorbing sheet having a plurality of elongated grooves extending in one direction along said sheet, said grooves disposed in a laterally spaced relation, feeding discrete lengths of solder strips from a solder dispenser in said one direction sequentially into said grooves, respectively, indexing said solder dispenser transversely of said one direction after feeding each strip of solder into the respective groove thereof, forming said solder strips into desired transverse configurations before placement thereof into said grooves, positioning a tube assembly on said sheet, said tube assembly having a plurality of laterally spaced conduits disposed in said grooves of said sheet in superimposed relation on said solder strips to form a loosely assembled unit, holding said unit together, and heating said unit to melt said solder strips and effect a thermal conductive bond between said tube assembly and said sheet.

4,310,117

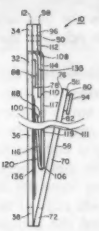
ENVELOPE

John R. Gullett, Quakertown, Pa., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Oct. 3, 1979, Ser. No. 81,442

Int. Cl.³ B65D *27/06*

U.S. Cl. 229—73 **5 Claims**



1. An envelope for use in the transfer of documents and things such as processed and unprocessed photographic film, the envelope comprising:

a first sheet having

(a) a first end,

(b) a second end opposite the first end,

(c) a first side edge extending between the first end and the second end,

(d) a second side edge opposite the first side edge and extending between the first end and the second end,

(e) an inner side,

(f) an outer side opposite the inner side,

(g) a fold line remote from the first end, remote from the second end and extending between the first side edge and the second side edge, the fold line defining two portions of the first sheet,

(h) one of the two portions being a flap portion defined between the fold line and the first end,

(i) the other of the two portions being an envelope portion defined between the fold line and the second end,

(j) a perforation line between the first end of the first sheet and the fold line of the first sheet and extending from the first side edge of the first sheet to the second side edge of the first sheet, the perforation line defining two sections of the flap portion of the first sheet,

(k) one of the two sections of the flap portion being a first stub section defined between the first end of the first sheet and the perforation line,

(l) the other of the two sections of the flap portion of the first sheet being a flap section defined between the perforation line and the fold line, and

(m) a first information zone defined on the outer side of the first sheet within the envelope portion, for the recordal of pre-selected information thereon;

a second sheet having

(a) a first end,

(b) a second end opposite the first end,

(c) a first side edge extending between the first end and the second end,

(d) a second side edge opposite the first side edge and extending between the first end and the second end,

(e) an inner side,

(f) an outer side opposite the inner side,

(g) a length between the first end and the second end substantially equal to the distance between the fold line and the second end of the first sheet, and

(h) a width between the first side edge and the second side edge substantially equal to the distance between the first side edge and the second side edge of the first sheet;

means for attaching the second sheet to the first sheet so as to form an envelope space with the inner side of the first sheet facing the inner side of the second sheet, the second end of the second sheet generally aligned with and at-

tached to the second end of the first sheet, the first side edge of the second sheet generally aligned with and attached to the portion of the first side edge of the first sheet along the envelope portion thereof, and the second side edge of the second sheet generally aligned with and attached to the portion of the second side edge of the first sheet along the envelope portion thereof;

a contact adhesive strip having a width substantially equal to the distance between the first side edge of the first sheet and the second side edge of the first sheet, and a pre-selected length;

a protective strip for protecting the envelope from damage from the contact adhesive strip having a width and a length substantially equal to the pre-selected width and pre-selected length, respectively, of the adhesive strip;

one of the adhesive strip and the protective strip joined to the inner side of the first sheet adjacent the first end thereof and extending from the first side edge of the first sheet to the second side edge of the first sheet, the other of the adhesive strip and the protective strip joined to the outer side of the second sheet at a distance from the first end thereof substantially equal to the distance of the one strip from the fold line of the first sheet and extending from the first side edge of the second sheet to the second side edge of the second sheet, so that the one strip overlies the other strip when the first sheet is folded along the fold line and the flap portion of the first sheet is brought into contact with the outer side of the second sheet;

the adhesive strip thereby adhering to the protective strip and the envelope being readily reuseable by separation of the contact adhesive strip from the protective strip;

a third sheet having

(a) a first end,

(b) a second end opposite the first end,

(c) a first side edge extending between the first end and the second end,

(d) a second side edge opposite the first side edge and extending between the first end and the second end,

(e) a first side,

(f) an information zone defined on the first side of the third sheet for the recordal of pre-chosen information thereon, the pre-chosen information being chosen from among the pre-selected information,

(g) the length between the first edge of the third sheet and the information zone of the third sheet substantially equal to the distance between the first information zone and the first edge of the first sheet,

(h) a width along at least a portion of the third sheet less than the distance between the first side edge and the second side edge of the first sheet so that the third sheet fits within the envelope space defined by the first sheet and the second sheet;

means for attaching the third sheet to the first stub portion of the first sheet, the third sheet thereby being attached to the first stub portion with the first edges of the first sheet and the second sheet generally aligned, the first side of the third sheet adjacent the inner side of the first sheet and the third sheet within the envelope space of the first sheet and the second sheet;

transfer means for transferring upon recordal the pre-chosen information from the information zone of the first sheet to the information zone of the third sheet, the transfer means positioned between the information zones of the first sheet and the third sheet; and

means for attaching the transfer means to the third sheet;

whereby the pre-selected information may be recorded on the first sheet, the first perforation line perforated and the third sheet removed from the envelope space, the result being, without further recordal of information and without need of a separate receipt, an envelope for the safe transfer of documents and things having the pre-selected information thereon and a separate sheet for retention as a receipt with the pre-chosen information thereon, and whereby the envelope can be used in the transfer of unprocessed photographic film to a processor for processing, reused for the return transfer of the film after processing, and reused for film storage.

4,310,118

PACKAGING BAGS FOR POWDERY MATERIALS

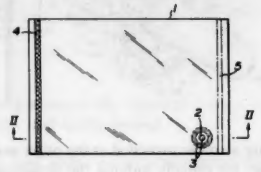
Ichihei Kisida, Tokyo; Takashi Kobayashi, Akashi, and Masahisa Matsushita, Omiya, all of Japan, assignors to C. I. Kasei Co. Ltd., Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,251

Claims priority, application Japan, Aug. 10, 1979, 54-109513[U]

Int. Cl.³ B65D *30/24*

U.S. Cl. 229—62.5 **7 Claims**



1. A packaging bag for powdery or granular materials made of a film or sheet having substantially no air permeability and comprising, generally flat side walls sealed along at least three sides of the bag, a filling opening along an end of the bag, one of said side walls having at least one aperture of a size smaller than the filling opening, and an air filter element within the bag, said filter element comprising a porous pad covering said aperture and directly bonded to the side wall around said aperture, said pad presenting an uncovered face within the bag, and said filter permitting the escape of air from the bag upon compression thereof after filling the bag and sealing the filling opening.

4,310,119

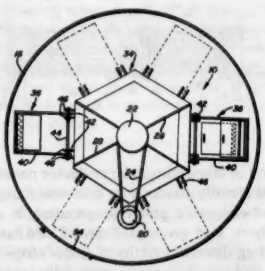
HONEY EXTRACTOR

Vernon C. Culhane, 2729 County Rd., and Danny F. Culhane, 300 Waters Way, both of Durango, Colo. 81301

Filed Aug. 16, 1979, Ser. No. 67,017

Int. Cl.³ B04B *11/00*; B01D *43/00*

U.S. Cl. 233—1 R **18 Claims**



1. An apparatus for centrifugal extraction of honey from honey bearing combs, said apparatus comprising in combination:

motor means;

a drive shaft operatively connected to said motor means for rotation about a vertical axis;

supporting structure connected to said drive shaft including a portion displaceable from a loading position to an extracting position in response to rotation of the drive shaft;

containment means for supporting said honey bearing combs

on said portion of the supporting structure during extraction of honey therefrom and means having a support surface substantially coplanar with said portion of the supporting structure for transfer of the containment means to and from said portion of the supporting structure in the loading position,

said containment means including a pan having a supporting portion for supporting said honey bearing combs and an extracted honey receiving portion.

4,310,120

ELASTIC RAIL FASTENING DEVICE

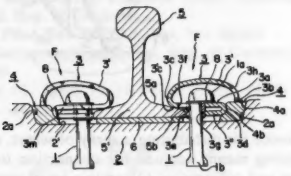
Yoshio Matsuo, and Kentaro Matsubara, both of Tokyo, Japan, assignors to Tetsudo Kizai Kogyo Company Limited, Tokyo, Japan

Filed Feb. 27, 1980, Ser. No. 125,390

Claims priority, application Japan, Apr. 27, 1979, 54-055904[U]

Int. Cl.³ E01B *9/34*

U.S. Cl. 238—349 **12 Claims**



12. In an elastic rail fastening device for securing an elongated rail to a support base, the elongated rail being positionable on top of the support base and having bottom flanges projecting outwardly from opposite sides thereof, the base having rigid spikes fixed thereto and projecting upwardly therefrom on opposite sides of said rail, each said spike having a head portion fixedly and integrally associated therewith and defining thereon a downwardly-directed support surface, said spikes being spaced outwardly from the side edges of said bottom flanges, and the base having a spring receiver thereon in sidewardly spaced relationship from said bottom flange so that said spike is positioned therebetween, said spring receiver having an upwardly-facing abutment surface and an inner side surface which is disposed opposite but spaced outwardly from the side edge of the bottom flange, the improvement comprising:

a curved one-piece S-shaped platelike spring coacting between said spring receiver, said spike and said bottom flange for resiliently engaging the upper surface of said bottom flange to press said flange downwardly and for transferring side force from the rail to the spring receiver;

said S-shaped spring including upper, intermediate and lower leg portions with a first bent portion joined between one end of the intermediate leg portion and the top leg portion, and a second bent portion joined between the other end of said intermediate leg portion and said lower leg portion;

said first bent portion being urged downwardly so that an outer lower surface thereof is engaged with the upper surface of the bottom flange for urging the latter downwardly, and the second bent portion being disposed in contact with the inner side surface of said spring receiver;

said intermediate leg portion having a portion of the upper surface thereof maintained in engagement with the downwardly-directed support surface defined on said spike;

one end of said S-shaped spring as defined on said upper leg portion being in engagement with the abutment surface on said spring receiver, whereby said spring receiver urges said upper leg portion upwardly; and

the other end of said S-shaped spring as defined on said lower leg portion being disposed in engagement with the side edge of said bottom flange.

4,310,121

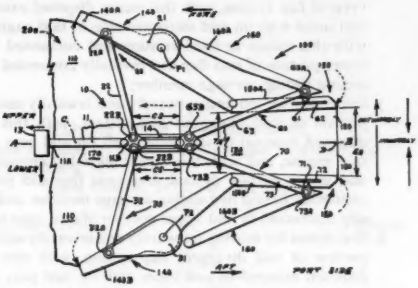
EXHAUST NOZZLE ACTUATION ASSEMBLY

Edward M. Basinski, Jr., Enfield, Conn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 30, 1980, Ser. No. 154,720

Int. Cl.³ B64C *15/04*

U.S. Cl. 239—265.33 **9 Claims**



1. An actuation assembly for a convergent-divergent exhaust nozzle of a gas turbine engine having a longitudinal axis, wherein said nozzle has a longitudinal axis coincident with said longitudinal axis of said engine, a fore end, an aft end, a throat having an area, a convergent flap system with an upper portion and a lower portion, a divergent flap system with an upper portion and a lower portion, an external flap system, with an upper portion and a lower portion, an inner wall, a port side, a starboard side, and an exit having an area, comprising:

a. a first linear actuator member disposed parallel to, and in equal spaced-apart relationship with, said longitudinal axis of said nozzle and external of said inner wall on said port side of said engine, with said first linear actuator member having a first end and a second end;

b. a second linear actuator member disposed parallel to, and in equal spaced-apart relationship with, said longitudinal axis of said nozzle and external of said inner wall on said starboard side of said engine, with said second linear actuator member having a first end and a second end;

c. means, common to said first and second linear actuators, for selectively, simultaneously, and linearly moving said first and second linear actuator members toward said fore end of said nozzle and toward said aft end of said nozzle, with said means connected to said first end of said first linear actuator member and to said first end of said second linear actuator member;

d. a first sliding carriage member disposed parallel to, and in equal spaced-apart relationship with, said longitudinal axis of said nozzle and external of said inner wall on said port side of said engine, with said first sliding carriage member connected to said second end of said first linear actuator member;

e. a second sliding carriage member disposed parallel to, and in equal spaced-apart relationship with, said longitudinal axis of said nozzle and external of said inner wall on said starboard side of said engine, with said second sliding carriage member connected to said second end of said second linear actuator member;

f. first means for pivoting said upper portion of said convergent flap system, with this means disposed external of said inner wall on said port side of said engine, and with this means in fixed relation and connected to said upper portion of said convergent flap and pivotally connected to said first sliding carriage member;

g. first means for pivoting said lower portion of said convergent flap system, with this means disposed external of said inner wall on said port side of said engine, and with this means in fixed relation and connected to said lower portion of said flap and pivotally connected to said first sliding carriage member;

h. second means for pivoting said upper portion of said convergent flap system, with this means disposed external of said inner wall on said starboard side of said engine, and with this means in fixed relation and connected to said upper portion of said convergent flap system and pivotally connected to said second sliding carriage member;

i. second means for pivoting said lower portion of said convergent flap system, with this means disposed external of said inner wall on said starboard side of said engine, and with this means in fixed relation and connected to said lower portion of said flap and pivotally connected to said second sliding carriage member;

j. first means for moving outwardly and inwardly said upper portion of said divergent flap system, with this means disposed external of said inner wall on said port side of said engine, and with this means slideably connected to said upper portion of said divergent flap and pivotally connected to said first sliding carriage member, and pivotally connected to said upper portion of said external flap;

k. first means for moving outwardly and inwardly said lower portion of said divergent flap system, with this means disposed external of said inner wall on said port side of said engine, and with this means slideably connected to said lower portion of said divergent flap system and pivotally connected to said first sliding carriage member, and pivotally connected to said lower portion of said external flap system;

l. second means for moving outwardly and inwardly said upper portion of said divergent flap system, with this means disposed external of said inner wall on said starboard side of said engine, and with this means slideably connected to said upper portion of said divergent flap system and pivotally connected to said second sliding carriage member, and pivotally connected to said upper portion of said external flap system;

m. and, second means for moving outwardly and inwardly said lower portion of said divergent flap system, with this means disposed external of said inner wall on said starboard side of said engine, and with this means slideably connected to said lower portion of said divergent flap system and pivotally connected to said second sliding carriage member, and pivotally connected to said lower portion of said external flap system;

whereby when said means for selectively, simultaneously, and linearly moving said first and second linear actuator members is moved toward said fore end of said exhaust nozzle, thereby said upper and lower portions of said convergent flap are pivoted and said upper and lower portions of said divergent flap system are moved inwardly, and thereby said throat area is at a minimum and simultaneously the minimum desired exit area is achieved;

and whereby when said means for selectively, simultaneously, and linearly moving said first and second linear actuator members is moved toward said aft end of said exhaust nozzle, thereby said upper and lower portions of said convergent flap are pivoted and said upper and lower portions of said divergent flap are moved outwardly, and thereby said throat area is at a maximum and simultaneously the maximum desired exit area is achieved;

and also whereby the length of linear movement of said means for selectively, simultaneously, and linearly moving said first and second linear actuator members to attain said minimum throat area, or to attain said minimum exit area, is the same;

and also whereby the length of linear movement at this means for selectively, simultaneously, and linearly moving said first and second linear actuator members to attain said maximum throat area, or to attain said maximum exit area, is the same;

4,310,122

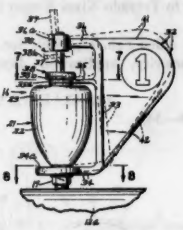
IRRIGATION SYSTEM AND VOLUME CONTROL VALVE THEREFOR

Merle A. Vikre, 32 Windward Way, New Port Richey, Fla. 33552

Division of Ser. No. 971,038, Dec. 19, 1978, Pat. No. 4,231,523, which is a continuation of Ser. No. 765,266, Feb. 3, 1977, abandoned. This application Jul. 31, 1980, Ser. No. 173,964

Int. Cl.³ B05B *1/26*

U.S. Cl. 239—502 **23 Claims**



1. A device for distributing a spray of water, comprising:

(a) housing means adapted for connection to a source of water and constructed to create a jet of water;

(b) spray deflector means disposed relative to the housing means for intercepting the jet of water and deflecting it into a spray pattern of predetermined shape and directional orientation;

(c) the spray deflector means being rotatably carried by the housing means for rotational movement to vary the directional orientation of said spray pattern;

(d) and wind sensing means associated with the spray deflector means for sensing wind direction and positioning the spray deflector means to direct the spray pattern into the wind.

4,310,123

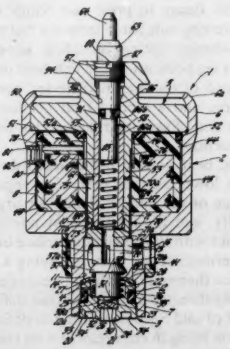
ELECTROMAGNETIC FUEL INJECTOR WITH ADJUSTABLE ARMATURE SPRING

Albert TePastte, Wyoming, MI, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 21, 1980, Ser. No. 170,735

Int. Cl.³ F02M *51/06*

U.S. Cl. 239—585 **2 Claims**



1. An electromagnetic fuel injection valve having a housing defining a generally cylindrical bore within which a tubular

solenoid pole is axially fixed and in which a cup-shaped armature is translated in opening and closing movements to open and close a fuel passage, a hollow tubular guide pin of predetermined axial extent telescoped at one end within said solenoid pole and having its opposite end extending a predetermined axial distance therefrom to slidably receive one end of said armature, a coil spring in said tubular guide pin effective at one end to bias said armature in a direction to close the fuel passage, and an adjustable stop element having an abutment shoulder at one end thereof loosely received within said tubular guide pin to abut against the other end of said spring, the other end of said stop element being axially adjustably secured to said solenoid pole, said stop element having an externally accessible driver-receiving head whereby said stop element can be axially adjusted to vary the load of said spring.

4,310,124

MIXER FOR VISCOUS MATERIALS, FOR EXAMPLE FOR FILTER CAKE, PULP OR THE LIKE

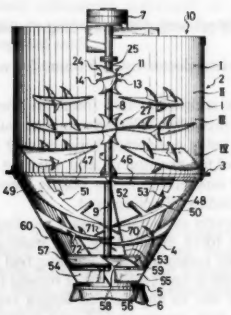
Gerhard Schwing, and Udo Pindras, both of Herne, Fed. Rep. of Germany, assignors to Friedrich Wilh. Schwing GmbH, Herne, Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 98,824

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1978, 2852499

Int. Cl.[3] **B02C** *13/24, 18/06, 18/18, 18/40*

U.S. Cl. 241—46.11 **9 Claims**



1. A mixer for low liquid content material, including filter cake, pulp, and the like, in which said material is initially comminuted and ground and thereafter mixed and thickened to render it pumpable, said mixer comprising:

a housing having a tubular portion **(1)** including an inlet at one end through which the material is received in the mixer;

a rotatable shaft **(9)** extending into said housing;

a first knife impeller **(11)** mounted in said tubular housing portion on said shaft for rotation therewith in a first plane (I);

a second, plural vane knife impeller **(27)** mounted on said shaft for rotation therewith in a second plane (III) spaced below said first plane;

first and second sets of stationary knives **(33–35; 40–42)** mounted on said tubular housing portion for coaction with said impellers, said first knife set being positioned in a plane (II) between said impellers, said second knife set being positioned in a plane (IV) below said second impeller, said impellers and stationary knives being mounted for mutual coaction to grind and comminute the material;

said housing having a frusto-conical portion mounted at the other end of said tubular portion and converging in the flow direction to an outlet through which the treated material is discharged;

a plurality of circumferentially spaced guide ribs **(53)** mounted in said conical housing portion;

a third set of stationary knives **(63, 64)** mounted in said conical housing portion;

guide paddles **(54, 55)** mounted in said conical housing portion below said third set of knives in the outlet of said conical housing portion;

helical ribbon segments **(48, 49)** mounted in said conical housing portion on said shaft for rotation therewith above said third set of knives; and

thrust paddles **(57–59, 70–72)** mounted on said shaft above and below said third set of knives,

said elements contained in said frusto-conical housing portion being mutually operatively associated to mix and thicken said material.

4,310,125

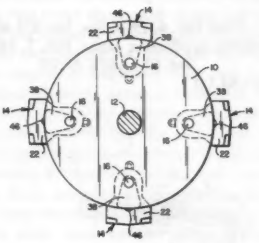
HAMMER FOR HAMMER MILL

Raymond J. Novotny, Sparta, N.J., assignor to Abex Corporation, New York, N.Y.

Filed Oct. 15, 1979, Ser. No. 84,956

Int. Cl.[3] **B02C** *13/28*

U.S. Cl. 241—195 **4 Claims**



1. A hammer adapted to be pivotally attached to rotors in a hammer mill, comprising a body, a lateral bore formed in the upper portion of the body which receives a device for pivotally attaching the hammer between an adjacent pair of rotors, a pair of sidewalls on the body which are perpendicular to the axis of the bore, said sidewalls defining the lateral width of the body and being generally flat and parallel to each other and each of said sidewalls being located adjacent a rotor when the hammer is attached to a pair of rotors, a recess formed in at least one of the sidewalls for receiving pieces of scrap which get between the one hammer sidewall and a rotor, the recess having a portion projecting beyond the outer periphery of the adjacent rotor so that pieces of scrap in the recess can be ejected therefrom and the lateral bore opens into the recess.

4,310,126

WINDING APPARATUS FOR PLASTIC LINE

Kenneth V. Norleen, Mitchellville, Md., assignor to Norco Landscaping & Maintenance Co., Inc., Mitchellville, Md.

Filed Oct. 7, 1980, Ser. No. 194,899

Int. Cl.[3] **B65H** *54/02, 57/12, 54/28*

U.S. Cl. 242—47 **12 Claims**

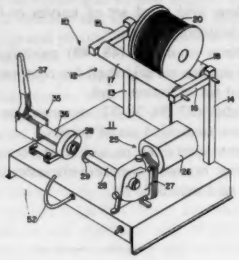
1. Winding apparatus comprising:

(a) means for rotatably supporting a supply reel,

(b) means for supporting and rotating a spool, and

(c) means for guiding a line drawn from said supply reel and wound on said spool comprising:

(i) tube means having a fixed inlet end and a discharge end, and



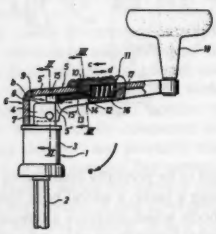
(ii) means for supporting the discharge end of said tube means for movement generally parallel to the axis of the spool.

4,310,127

FISHING SPINNING REEL

Tatsuya Yamasaki, Fuchu, Japan, assignor to Ryobi Limited, Japan

Filed Feb. 6, 1978, Ser. No. 875,486
Claims priority, application Japan, Feb. 7, 1977, 52-13907
Int. Cl.³ A01K *89/00*
U.S. Cl. 242—84.1 J **3 Claims**



1. A fishing spinning reel comprising:

(i) a reel body

(ii) a handle shaft journalled for rotation on said reel body and including an abutment portion with a first axially-facing abutment face and a second radially-facing abutment face

(iii) a handle arm mounted on the abutment portion by pivot means having a pivoting axis transverse to the axis of rotation of the handle shaft, whereby the handle arm is movable about said pivoting axis into a first position substantially radial to the axis of rotation of the handle shaft and a second position of folding towards the axis of rotation of the handle shaft, said handle arm including an abutment surface which in one of said positions is spaced axially from the first abutment face of the shaft and which in the other of said positions is spaced radially from said second abutment face of the shaft,

(iv) a locking element carried by the handle arm and movable longitudinally of the arm into a locking state in which it engages between the abutment surface of the arm and selectively the first or second abutment face of the shaft to lock the handle arm in the respective position, and into a retracted state, and

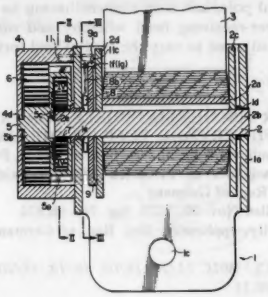
(v) resilient means acting between the handle arm and the locking element to urge the locking element into the locking state.

4,310,128

SEAT BELT RETRACTING AND WINDING DEVICE

Masayuki Morita, Tokoname; Takashi Kawaharazaki, Ichinomiya, and Toshiaki Shimogawa, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation of Ser. No. 656,850, Feb. 10, 1976, abandoned. This application Apr. 14, 1977, Ser. No. 787,534
Claims priority, application Japan, Feb. 18, 1975, 50-20673; Aug. 9, 1975, 50-96771; Aug. 9, 1975, 50-96775
Int. Cl.³ A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107 **29 Claims**



23. A seat belt retracting and winding device comprising:

a frame,

a winding reel supported by said frame for winding thereon a seat belt,

biasing means secured to said frame and being capable of selectively providing relatively smaller and larger biasing forces and being connected between said frame and said winding reel for exerting on said winding reel a selected one of said smaller and larger biasing forces acting in the seat belt winding direction, and

means operatively connected to said winding reel to select the biasing force effected by said biasing means in response to the rotation of said winding reel for causing the biasing means to exert said smaller biasing force when said belt is paid out to any desired length regardless of the amount of belt unwound and said larger biasing force when said belt is retracted.

4,310,129

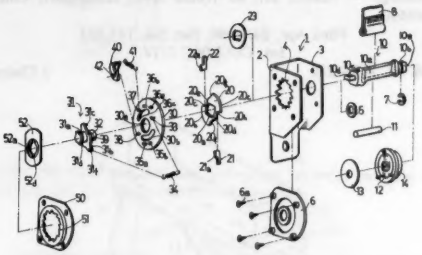
SEAT BELT RETRACTOR WITH EMERGENCY LOCKING MECHANISM

Masaru Morinaga, Yamato, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 105,141, Dec. 19, 1979. This application Feb. 22, 1980, Ser. No. 123,726
Claims priority, application Japan, Feb. 26, 1979, 54/23895[U]
The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.
Int. Cl.³ A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107.4 B **4 Claims**

1. A seat belt retractor having an emergency locking mechanism, comprising a seat belt retractor body having right and left side plates, each having an opening therein, and a retractor shaft rotatably mounted therebetween and extending therethrough; a first locking means provided on the periphery of said opening in said left side plate; a support member having therein pawls adapted to be engaged with said first locking means to lock said retractor shaft when in their engaged position, and a retaining member which are integrally secured to the left end of said retractor shaft; a plate mounted on said retaining member such that it is turnable together with said retaining member but is movable to a limited extent relative

thereto; means for moving said pawls into locking engagement with said first locking means when said support member is moved relative to said plate; a pawl member which is rockingly mounted on said plate; one end of a seat belt webbing being fixed to said retractor shaft; a detecting means adapted to detect an abrupt acceleration of said webbing; and a cover having therein a second locking means whereby when there is



an abrupt acceleration of said webbing, said detecting means causes said last mentioned pawl member to engage said second locking means, thereby locking said plate, further rotation of said shaft causing said support member to move relative to said plate and to cause subsequent movement of said first mentioned pawls into engagement with said first locking means, therefore locking said shaft.

4,310,130

METHOD AND APPARATUS FOR TAKING UP TAPE

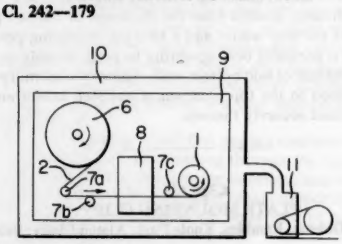
Takashi Ichiyanagi, Hirakata; Kiyokazu Imanishi, Higashiosaka; Hidetoshi Kawa, Ibaraki, and Katsuyuki Yamamoto, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 5, 1980, Ser. No. 127,529

Claims priority, application Japan, Mar. 9, 1979, 54-28098

Int. Cl.[3] G03B *1/04;* G11B *15/58*

U.S. Cl. 242—179 **7 Claims**



2. An apparatus for taking up a tape from a supply reel on a take-up reel mounted on a spindle which is coupled to a drive means, comprising a depressurized chamber with a tape inlet port formed through one wall thereof, a gas evacuating means for evacuating said chamber to and maintaining said chamber at a pressure in the range of 0.3 to 0.0001 atm., and a drive shaft for rotating said spindle, whereby the tape which has been guided through said tape inlet port into said depressurized chamber is taken up on said take-up reel while the pressure in said depressurized chamber is reduced to and maintained at from 0.3 to 0.0001 atm.

4,310,131

BRAKING MECHANISM, AS FOR A TAPE RECORDER

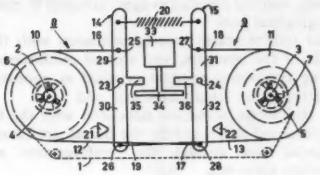
Horst Althuber, and Helmut Prulamp, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 37,783, May 10, 1979, abandoned. This application Apr. 14, 1980, Ser. No. 140,395

Claims priority, application Austria, May 10, 1978, 3646/78

Int. Cl.[3] G03B *1/04;* G11B *15/32*

U.S. Cl. 242—204 **5 Claims**



1. A mechanism for moving a tape in opposite directions between two rotatable winding hubs, comprising

two winding spindle means having respective spindle axes, for driving respective winding hubs, and

a braking arrangement for braking respective winding hubs, comprising two brake discs, each connected to a respective spindle and rotatable about a respective disc axis; two brake bands, each having two ends and each arranged to operatively engage a respective disc; two brake levers each mounted pivotally about a respective lever pivot axis; means for connecting each end of a brake band to a lever; resilient means for biassing said levers to urge the brake bands against the discs during braking, said resilient means including at least one brake spring; and a stop for each brake lever arranged to limit pivotal movement of the brake lever resulting from the biassing of the lever,

wherein each brake band has one end connected to one brake lever and the other end connected to the other lever, brake band connection points on the one lever for the two respective brake bands being spaced different distances from the respective lever pivot axis.

4,310,132

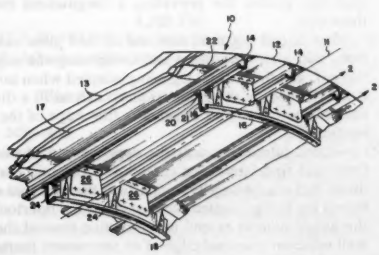
FUSELAGE STRUCTURE USING ADVANCED TECHNOLOGY FIBER REINFORCED COMPOSITES

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Robert K. Robinson, Mercer Island, and Harry M. Tomlinson, Bellevue, both of Wash.

Filed Feb. 16, 1978, Ser. No. 878,540

Int. Cl.[3] B64C *1/06, 1/12*

U.S. Cl. 244—119 **25 Claims**



1. A fuselage structure comprising:

a fuselage having a longitudinal axis;

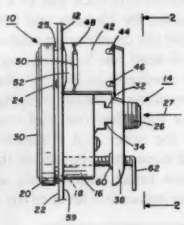
an external skin of alternate layers of composite material,

oriented at a biased angle relative to the longitudinal axis and at approximately 90° to the biased angle;
stringers, having outboard and inboard ends;
frames;
circumferential pads of composite material located on an inner surface of the external skin between said external skin and said frames and oriented at approximately 90° relative to the longitudinal axis;
first reinforcement means, associated with the outboard ends of the stringers, said first reinforcement means being composite material oriented as approximately 0° relative to the longitudinal axis;
second reinforcement means, associated with the inboard ends of the stringers, said second reinforcement means being composite material oriented at approximately 0° relative to the longitudinal axis; and
third reinforcement means associated with the frames and the external skin whereby the frames are fastened to the external skin through the reinforcement means and through shear ties.

4,310,133
CLAMP FOR PANEL MOUNTING OF GAUGE INSTRUMENTS

Richard H. Wetterhorn, Fairfield, and David A. Busch, Stratford, both of Conn., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 931,809, Aug. 7, 1978, abandoned. This application Apr. 14, 1980, Ser. No. 139,956
Int. Cl.³ G12B 9/10
U.S. Cl. 248—27.1 **4 Claims**

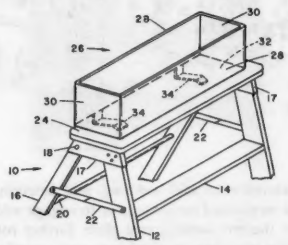


1. A clamp for concealed panel wall mounting a rear inlet connected stem gauge instrument comprising in combination:
(a) an elongated metal plate of length at least sufficient to span the width of the gauge instrument to be mounted;
(b) a first opening defined in said plate of size at least sufficient to pass the inlet stem of the gauge;
(c) a centrally located keyslot opening in said plate communicating with said first opening thereof and of insufficient size to pass the inlet stem of the gauge, said keyslot opening being of predetermined geometric configuration to interfit with a transverse formation on the gauge stem of at least one groove for providing a longitudinal interlock therewith;
(d) a first lateral leg near one end of said plate extending from said plate to a distal end comprising the edge face thereof, said first lateral leg being adapted when said plate is interlocked on the gauge stem to extend in a direction toward the panel wall adjacent a first edge of the gauge instrument;
(e) a second lateral leg near the opposite end of said plate from said first lateral leg extending from said plate to a distal end comprising the edge face thereof, said second lateral leg being adapted when said plate is interlocked on the gauge stem to extend in a direction toward the panel wall adjacent a second edge of an instrument thereat; and
(f) one of said first or second legs comprising a lateral offset extending integrally from said plate while only the other of said legs is threadedly connected to said plate and effective when its edge face engages the panel wall for providing a takeup adjustment to mount the gauge instrument securely against the panel wall.

4,310,134
STEP LADDER UTILITY BOX

Anthony L. Schopp, 655 Ruth St., Bridgeport, Conn. 06606, and George N. Macol, Jr., 80 Weber Ave., Bridgeport, Conn. 06610

Filed Apr. 24, 1980, Ser. No. 143,432
Int. Cl.³ E06C 7/14
U.S. Cl. 248—210 **2 Claims**



1. A utility box for holding tools and the like and adapted to be placed on and secured to the top platform of a step ladder, said utility box comprising:
A. a bottom wall having a generally rectangular configuration such that said bottom wall will be substantially close to the dimensions of the generally rectangular top platform of a step ladder,
B. a pair of side walls and a pair of end walls connected to said bottom wall to form a receptacle having the dimensions of said bottom wall, so that said receptacle will normally remain in position on said top platform of its own weight when placed thereon, and
C. resilient retaining means secured to said utility box and extending laterally beneath said bottom wall, said resilient retaining means comprising a plurality of clips secured to said utility box adjacent the intersection of said bottom wall and one of said side walls, said clips having a depending portion which extends downwardly from said intersection of said bottom wall with said one of said side walls for a distance greater than the thickness of the top platform of the step ladder and a laterally extending portion which is normally bent upwardly to press forcibly on the undersurface of said bottom wall, whereby said utility box is fastened to the top platform of the step ladder and is maintained securely thereon.

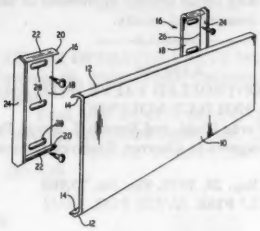
4,310,135
PLATE MOUNTING CLIP

Charles E. Dobson, Rambles, Knole Park, Almondsbury, Bristol, England

Filed Oct. 15, 1979, Ser. No. 84,576
Claims priority, application United Kingdom, Oct. 19, 1978, 41232/78
Int. Cl.³ F16M 13/00; G09F 7/18
U.S. Cl. 248—221.4 **5 Claims**

1. A mounting clip for a plate of shallow channel cross-section having rearwardly directed flanges with mutually convergent portions on their facing surfaces, the clip having a flat base member for securing to a support surface, a pair of ribs projecting from opposite edges of the base member with the surface between said ribs being free of projections, the mutually remote surface of the ribs having divergent portions for

co-operating with the convergent portions of the flanges of a said plate clipped thereto, and an integral end flange projecting



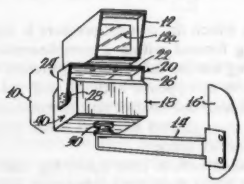
from the base member and extending between the ribs for closing the end of the channel of the plate.

4,310,136

BACKLASH-FREE SWIVEL AND TILT MOUNTING

Paul C. Mooney, Northbrook, Ill., assignor to Quick-Set, Incorporated, Northbrook, Ill.

Filed Nov. 13, 1979, Ser. No. 93,797
Int. Cl.³ E04G *3/00*
U.S. Cl. 248—278 **4 Claims**



1. An improved pan and tilt mounting for a television camera or the like comprising:

a fixed support;

a base having top and bottom surfaces, front and back walls, and side walls rotatably connected to said fixed support at said bottom surface;

a support frame attached to said camera and rotatably connected to said base side wall;

a first bearing assembly including dual ball bearings having inner and outer races respectively attached to said side wall and located in a bore formed in said side wall,

a second bearing assembly including dual ball bearings having inner and outer races respectively attached to said bottom surface and located in a bore formed in said bottom surface;

a first shaft journaled in said first bearing assembly including a cylindrical portion extending through the beyond both inner races of said first bearing assembly, said cylindrical portion being rigidly connected to said support frame, and a raised shoulder abutting the inner race of one of said bearings;

a second shaft journaled in said second bearing assembly including a cylindrical portion extending through and beyond both inner races of said second bearing assembly, said cylindrical portion being rigidly attached to said fixed support, and a raised shoulder abutting the inner race of one of said bearings;

drive means associated with each of said first and second shafts having a backlash free drive train and including a power output which is rigidly attached to the ends of said first and second shafts adjacent said shaft shoulders; and

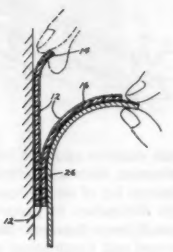
adjustment means including projections which bear upon the inner races of the bearings remote from the shaft shoulders and which may be adjusted to maintain contact between said bearing inner races and said shaft shoulders at all times.

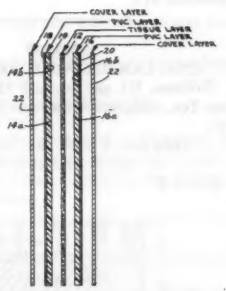
4,310,137

SELF HOLDING SEPARABLE MOUNT

Bruce J. Frye, Rte. 3, Box 76, Luck, Wis. 54853

Filed Sep. 8, 1980, Ser. No. 185,366
Int. Cl.³ A47F *7/14*
U.S. Cl. 248—467 **4 Claims**





1. A holding member for removably securing an object into a supporting surface comprising

an intermediate layer of a non-fusible rupturable material,

layers of a fusible material overlaying each side of said intermediate layer,

the surface portions of said layers facing said intermediate layer impregnating said intermediate layer,

means adhesively coating the surface portions of said layers remote from and facing outwardly of said intermediate layer, and

a removable protective strip overlaying said last mentioned adhesively coated surface portions.

4,310,138

SELF-SUPPORTING SHRINKING MANDREL

George S. Johnston, 6390 Bridgewood Valley Dr., Atlanta, Ga. 30328

Filed Jun. 18, 1980, Ser. No. 160,603
Int. Cl.³ B28B *7/30*
U.S. Cl. 249—180 **6 Claims**

1. An improved mandrel comprising in combination:

N support members, N being an integer greater than two;

each support member of said N support members including a pair of grooves, one groove of said pair of grooves being disposed on each of two adjacent sides of said support member;

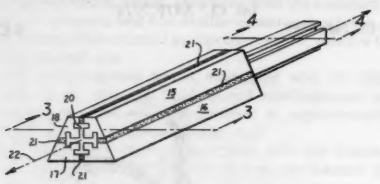
an actuator member characterized by a longitudinal axis;

said actuator member including N legs extending radially from said longitudinal axis;

each of said legs including a cross member of predetermined

constant width in cross sections perpendicular to said longitudinal axis aligned for slidable engagement with at least two of said grooves on two adjacent support members of said N support members; and

wherein for each said cross member supported by one leg of said N legs, said actuator member is characterized by a diminishing minimum distance between a distal edge of



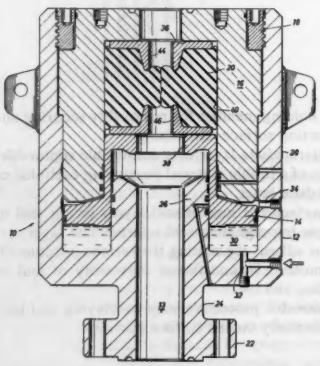
said cross member and said longitudinal axis and a constant minimum distance between said distal edge and a next adjacent leg of said N legs, and the width of each of said legs diminishes in proportion to said diminishing minimum distance between said distal edge of said cross member and said longitudinal axis in cross sections taken from a root end to a tip end in planes perpendicular to said longitudinal axis.

4,310,139

ANNULAR BLOWOUT PREVENTER

Bolie C. Williams, III, and Richard M. Church, Jr., both of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Apr. 4, 1980, Ser. No. 137,549
Int. Cl.³ E21B *33/06*
U.S. Cl. 251—1 B **14 Claims**



1. A packer for use in an annular blowout preventer having means for axially compressing the packer comprising

an annulus of resilient material having an inner periphery, and

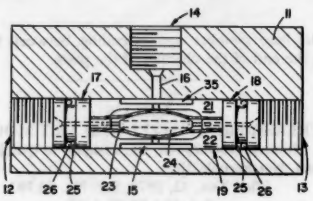
a substantially circular series of rigid inserts which are arranged on and bonded to the upper end of the annulus, said inserts having a flat body portion and a stem portion depending from the inner ends of the body portion, the flat body portion of said inserts being generally perpendicular to the axis of said annulus with the radially innermost ends of the body portions being substantially adjacent the inner periphery of said annulus when the annulus is unconstricted and being generally triangular shaped, skewed to the packer axis, and in abutment with each other and the stem portion extending a distance downward in the annulus substantially less than the compressed length of the annulus when sealed, said inserts being responsive to the axial compression of said material to cause said inserts to pivot to a position with their inner ends supporting a reduced diameter of said annulus, as said inner periphery is constricted with radial inward movement of said material when it is compressed axially.

4,310,140

PRESSURE-CONTROLLED VALVE WITH SMALL HOLD-UP VOLUME

Daryl R. Boomer, Yorba Linda, and Russell E. Boyer, Fullerton, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Sep. 28, 1979, Ser. No. 79,906
Int. Cl.³ F16K *31/126;* F16L *55/14*
U.S. Cl. 251—5 **8 Claims**



1. In a pressure-controlled valve the improvement comprising:

(a) a chamber in which the control pressure is applied, said chamber being formed within a complimentary pair of members having cut-out inner portions therein, with inlet and outlet ports at opposite ends of said cut-out inner portions and at least one control port communicating with said chamber through said members other than through said inlet and outlet ports;

(b) an elastic-walled hollow tube traversing said chamber, there being no direct fluid current between said chamber and the interior of said tube, the sole communication between said chamber and said interior of said tube being through elastic diminution of the internal circumference of said hollow tube in response to relative fluid pressure increase of said control pressure in said chamber with respect to fluid pressure in said interior of said tube said hollow tube being supported within said chamber in cooperation with said inlet and outlet ports in a manner to establish said no direct fluid current between said chamber and the interior of said tube;

(c) a flow obstructing body within said hollow tube, said body having a substantially elliptic cross-section with the major axis of said elliptical cross-section being parallel to the axis of said hollow tube and the minor axis of said elliptical cross-section being perpendicular to the axis of said hollow tube, said body having a transverse cross-section circumference along said minor elliptical axis which is larger than the relaxed internal circumference of said hollow tube and smaller than the traverse dimension of at least a portion of said chamber throughout the entire length of said chamber parallel to the axis of said hollow tube;

(d) a flow conducting annulus being established between the exterior of said body and the interior wall of said tube by elastic expansion of said elastic-walled hollow tube into said chamber due to larger fluid pressure in the interior of said tube with respect to said control pressure in said chamber from said control port, said flow-conducting annulus between said body and the interior wall of said tube being diminishable by said elastic diminution of the circumference of said tube toward contact with said body in response to fluid pressure increase in said chamber from said control port, whereby the flow through said flow-conducting annulus is reduced substantially to zero when

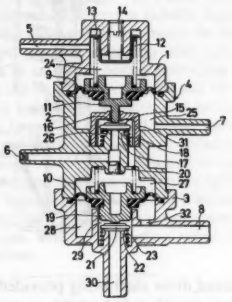
the fluid pressure in said interior of said tube drops below said control pressure in said chamber from said control port.

4,310,141

VACUUM OPERATED VALVE MECHANISM

Tooru Tamura, 40, Nakaneyama, Takaoka-honmachi, Tokoya City, Japan

Filed Mar. 29, 1979, Ser. No. 25,202
Claims priority, application Japan, Apr. 7, 1978, 53-46242[U]
Int. Cl.³ F16K *31/128*
U.S. Cl. 251—28 **8 Claims**



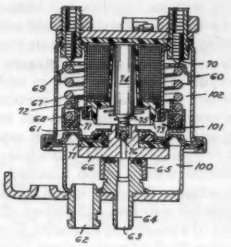
1. A vacuum operated valve mechanism comprising:
a single housing having first and second inlet ports which receive vacuum pressure first and second atomospheric inlet means and an outlet port;
a first diaphragm member disposed within said housing;
a first piston member connected to said first diaphragm and arranged within said housing to thereby divide said housing into a first vacuum chamber which is connected to said first inlet port and a first atmospheric chamber connected to said first atmospheric inlet means;
means for biasing said first piston member disposed within said housing into a first position when the pressure differential between said first vacuum chamber and said first atmospheric chamber is less than a first predetermined value;
a pilot valve member mounted within said housing and actuated by engagement with said first piston member when said first piston member is in said first position;
a second diaphragm member disposed within said housing;
a second piston member connected to said second diaphragm and arranged within said housing to thereby divide said housing into a second chamber and a second atmospheric chamber said second atmospheric chamber being connected to said second atmospheric inlet means, said second chamber being in selective communication with said second inlet port through means of said pilot valve member when said pilot valve member is actuated, said second chamber being in selective communication with said first atmospheric chamber when said pilot valve member is not actuated, wherein the air pressure differential between said second chamber and said second atmospheric chamber is zero when said first piston is in said first position;
biasing means biasing said second piston member in said housing to a first position until the pressure differential between said second chamber and said second atmospheric chamber reaches a second predetermined value smaller than said first predetermined value; and
a working valve member mounted in said housing and actuated by engagement with said second piston in a second position to introduce atmospheric pressure into said outlet port.

4,310,142

FUEL PRESSURE REGULATOR ASSEMBLY

George C. Ludwig, Florence, S.C., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.

Filed Mar. 13, 1980, Ser. No. 130,082
Int. Cl.³ F16K *31/12*
U.S. Cl. 251—30 **3 Claims**



1. A fuel pressure regulator assembly comprising
a housing,
a first diaphragm separating said housing into a first and second chamber,
said housing having a fuel inlet extending to said first chamber,
a connector mounted in said housing and extending axially into said first chamber,
said connector having an axial fuel outlet,
a sealing ring of resilient material,
interengaging means between said sealing ring and said connector for mounting said sealing ring on said connector such that a portion of said sealing ring projects axially beyond said connector,
said first diaphragm having a valve member adapted to engage said sealing ring,
and spring means in said second chamber urging said valve member against said sealing ring,
a second diaphragm defining a third chamber between said first and second chambers,
said second diaphragm being movable with said valve member,
said valve member having an opening therethrough providing communication between said first chamber and said third chamber,
a solenoid in said second chamber of said housing having a plunger extending into said third chamber and operable to control the axial opening in said valve member.

4,310,143

ELECTRICALLY CONTROLLED PROPORTIONAL VALVE

Roger G. Determan, North Branch, Minn., assignor to Gresen Manufacturing Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 964,475, Nov. 29, 1978, abandoned. This application Aug. 15, 1980, Ser. No. 178,389
Int. Cl.³ F15B *13/043, 13/044;* F16K *31/08*
U.S. Cl. 251—30 **16 Claims**

1. An electrically controlled valve comprising:
(a) a housing having a central elongation axis;
(b) first and second substantially semicylindrical magnetic members disposed about said axis of said housing and defining a substantially cylindrical chamber therebetween;
(c) a substantially cylindrical valve body mounted within said cylindrical chamber defined by said first and second magnetic members, said cylindrical valve body having a central axis aligned with said axis of said housing, said valve body having an axial passageway therethrough along said central axis and a plurality of inlet and outlet passageways extending generally radially outward with

respect to said axial passageway and in fluid communication with said axial passageway;

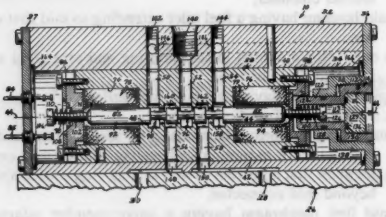
(d) a valve member mounted for axial reciprocation in said axial passageway and having means for establishing fluid communication between selected ones of said inlet and said outlet passageways, said valve member having a magnetizable portion;

(e) conductive coil having a central axis and disposed within said housing with said central axis aligned with said central axis of said valve body with said valve member portion extending into said coil along its central axis; and

(f) means for controlling the energization of said coil to induce a regulated magnetic field in said portion of said valve member, said magnetized portion of said valve member interacting with said first and second semicylindrical magnetic members to position said valve member along said central axis of said valve body.

7. In combination with a piston actuated hydraulic valve having a piston actuator disposed within a chamber, the piston dividing the chamber into first and second chamber portions, the piston affixed to a piston rod extending from said valve, the valve having hydraulic fluid passageways opening into the first and second chamber portions, a pilot valve comprising:

(a) an elongated valve body having an elongation axis and an axial passageway therethrough aligned along said elonga-



tion axis; said valve body having an inlet passageway, at least one exhaust passageway, and first and second outlet passageways; said inlet, exhaust and outlet passageways in fluid communication with said axial passageway and each of said first and second outlet passageways in fluid communication with one of said fluid passageways of said hydraulic valve;

(b) means disposed about said valve body for establishing a biased magnetic field within said valve body and said axial passageway;

(c) a valve member mounted for axial reciprocation within said axial passageway to selectively establish fluid communication between said inlet, exhaust and first and second oulet passageways, said valve member having a first portion that is magnetizable when placed in a magnetic field and which loses its magnetization upon removal of said inducing magnetic field;

(d) electromagnetic means mounted to said valve body for inducing a magnetic field to magnetize said first portion of said valve member, said magnetized first portion interacting with said biased magnetic field to position said valve member along said axial passageway; and

(e) control means for regulating the energization of said electromagnetic means to selectively position said valve member.

4,310,144

VALVE DRIVE MEANS FOR BACKWASH FILTER VALVES

Hisami Nogaki, 13316 Felson Pl., Cerritos, Calif. 90701

Filed Jan. 11, 1980, Ser. No. 111,376

Int. Cl.[3] F16K *31/04*; F16H *1/18*

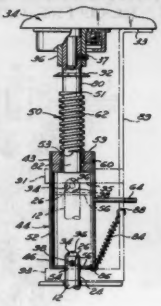
U.S. Cl. 251—134 **24 Claims**

1. A valve drive for a vertical up-down valve having a shaft with one or more seal rings affixed thereto, said shaft being axially movable within a cylindrical valve bore between a normal valve position and an occasional valve position comprising:

a motor drive,

a threaded rotatable, normally vertical drive shaft operatively connected to said motor drive;

threaded coupler means coupling said drive shaft to said valve shaft for exerting axial force thereon to thereby linearly move said valve shaft; and



said threaded drive shaft being provided with an upper and a lower non-threaded portion, said threading being formed on a drive shaft portion intermediate said non-threaded portions and corresponding in length to the linear movement of said valve shaft between said normal and said occasional valve positions to thereby precisely limit said linear movement of said coupler means and said valve shaft by disengagement of said threaded coupler means from said threaded portion of said drive shaft irrespective of rotation of said drive shaft.

4,310,145

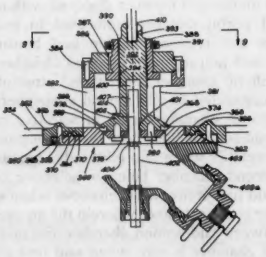
COMBINATION TOP OPERABLE AND BOTTOM OPERABLE TANK LADING VALVE ASSEMBLY

Richard J. Wempe, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 908,184, May 22, 1978. This application Apr. 12, 1980, Ser. No. 142,302

Int. Cl.[3] F16K *1/02*

U.S. Cl. 251—144 **11 Claims**



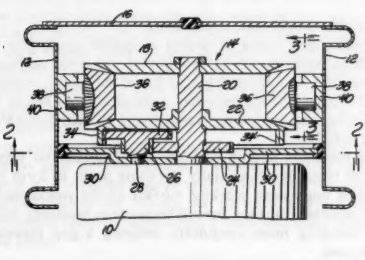
1. A railway tank car lading valve assembly comprising: a mounting flange located in a tank opening in the bottom of the tank; said mounting flange having a mounting flange opening therein; a valve seat located within said mounting flange opening; removable fastening means connecting said mounting flange to said valve seat; said valve seat including a valve seat opening centrally thereof; a valve cage integral with said valve seat and including a plurality of legs located outboard of said

valve seat opening and inboard of said mounting flange; said legs extending generally vertically upwardly into said tank from said seat; said legs having spaced portions therebetween for lading flow into said valve seat opening; said legs supporting a generally horizontally extending keeper located within said tank and inboard of said legs; said keeper having internally threaded means for laterally supporting and guiding an operating shaft means having an externally threaded portion adjacent said internally threaded means; said operating shaft means having a removable first portion extending to the top of the tank; said operating shaft means further including a second portion extending downwardly from said keeper and supporting a lading valve located within said valve seat opening inwardly of said seat and being movable vertically between open and closed positions relative to said valve seat; said operating shaft first portion adapted to receive a suitable handle or tool to rotate said operating shaft means and move the lading valve from a closed, seated position engaging said valve seat upwardly into the tank to an open position providing fluid communication between the interior of said tank and the outside of said tank; said lading valve being hollow and having a lading valve opening in its lower surface; said lading valve opening including a non-round portion adapted to receive a bottom operator having a non-round portion adapted to operate said lading valve, whereby said lading valve may be operated from either the top or the bottom of said tank, and whereby said first and second operating shaft means may be separated, and said valve seat, valve cage, keeper and lading valve may be removed from the bottom.

4,310,146
MOTOR-DRIVEN WINCH HAVING INTERNAL SPEED REDUCER

Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 31, 1979, Ser. No. 108,897
Int. Cl.³ B66D 1/22
U.S. Cl. 254—342 **1 Claim**

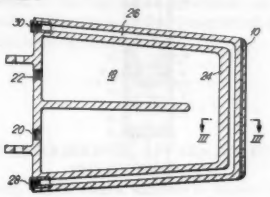


1. In a motor-operated winch, the combination comprising a hollow winding drum having an end wall (16) and annular wall; means for rotating the drum around its axis comprising a motor (10) at least partially disposed within the drum so that the motor shaft is located on the drum axis, a plate (30) carried by the motor so that its periphery is engaged with the interior surface of the winding drum annular wall to provide a sealed space within the drum; and differential type speed reducer means located in the sealed space between the motor plate and drum annular wall for driving said drum at a speed substantially less than motor speed; said differential type speed reducer means including a first bevel gear (18) directly connected to the motor shaft for movement in one direction at one speed, a second bevel gear (22) floatably positioned on the motor shaft for movement in the opposite direction at a different speed; means for driving said second bevel gear comprising a first pinion gear (24) affixed to the motor shaft in the space immediately adjacent the aforementioned motor plate, a second relatively small pinion gear (26) mounted on the motor plate in meshed engagement with the first pinion gear, a third relatively large pinion gear (32) carried by the second pinion gear, and a ring gear (34) carried by the second bevel gear in mesh with said relatively large pinion gear; and third bevel gear means (36) carried by the drum in simultaneous meshing engagement with the first and second bevel gears; said gears and gear means being operatively arranged so that the third bevel gear means slowly orbits around the motor axis, carrying the drum therewith; said third bevel gear means comprising a plurality of bevel gears individually rotatable around separate radiating axis located in a plane normal to the motor axis, each of the last mentioned bevel gears being in simultaneous meshing engagement with the first and second bevel gears.

4,310,147
COOLED COMPONENTS FOR FURNACES

Colin F. Widmer, 67 Levenside, Stokesley, Middlesbrough, Cleveland, England (TS9 5BH)

PCT No. PCT/GB78/00055, § 371 Date Aug. 23, 1979, § 102(e) Date Aug. 13, 1979, PCT Pub. No. WO79/00431, PCT Pub. Date Jul. 12, 1979
PCT Filed Dec. 20, 1978, Ser. No. 145,063
Int. Cl.³ C21B 7/10
U.S. Cl. 266—190 **5 Claims**



1. In a cast metallic component of high heat conductivity, and having cooling fluid passageways therein, for location in the lining of a lined furnace, the component having a main body portion and a nose portion to be directed towards the interior of the furnace, the improvement comprising an element chosen from the group consisting of a mesh element and an expanded metal element embedded in said nose portion, said element having greater abrasion resistance than the metal of said cast component to reinforce said nose portion against abrasion by the charge in the furnace.

4,310,148
CYLINDER-AND-PISTON DEVICE

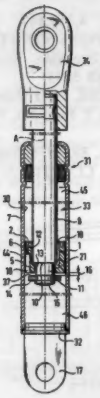
Herbert Freitag, Koblenz-Metternich, Fed. Rep. of Germany, assignor to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Filed Nov. 14, 1979, Ser. No. 94,073
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1978, 7834406[U]; Nov. 18, 1978, 7834364[U]
Int. Cl.³ B60G 11/26
U.S. Cl. 267—124 **20 Claims**

1. In a pneumatic cylinder-and-piston device including a cylinder member having a longitudinal axis and two axial ends, the inner cylindrical face of said cylinder member and said axial ends defining a sealed cavity within said cylinder member; a piston rod member extending into said cavity through at least one of said axial ends for axial movement with respect to said cylinder member; a piston member mounted on said piston rod member inside said cavity for axial movement with said piston rod member, said piston member defining two compartments within said cavity; a fluid under superatmospheric pressure in said cavity; means defining at least one passage extending between said two compartments axially across said piston member; and means associated with said passage-defining means for opening and closing said at least one passage in

dependency on the direction of movement of said piston member, the improvement comprising:

an axially extending sleeve carried by said piston member, said piston and sleeve defining a circumferential gap between the radially outer circumferential faces thereof and the inner cylindrical face of said cylinder member, a first axial end of said sleeve being integral with said piston member and the second axial end of said sleeve being adjacent to one of said compartments, at least said second end of said sleeve being elastically deflectable in the radial direction with respect to the longitudinal axis of the cylinder member, means defining a circumferential projection on the radially outer wall of said sleeve at an axial position



remote from said first end of said sleeve in the direction of said second end of said sleeve, said circumferential gap communicating at one end with said other compartment and extending from said one end thereof in the direction of said one compartment to at least the location of said annular projection, said projection extending radially outward from said sleeve towards the inner cylindrical face of said cylinder member, said second end of said sleeve being ruged in the radially outward direction to establish sealing contact of said projection with said inner cylindrical face when the fluid pressure in said one compartment is increased above the fluid pressure in the other compartment.

4,310,149

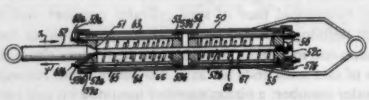
SHOCK ABSORBER

Thomas M. Camilleri, Brooklyn, N.Y., assignor to Sycam Advanced Technology Corp., East Meadow, N.Y.

Continuation-in-part of Ser. No. 024,947, Mar. 29, 1979, Pat. No. 4,251,064. This application Apr. 23, 1980, Ser. No. 143,813

Int. Cl.³ F16F *3/00*

U.S. Cl. 267—136 **19 Claims**



1. A shock absorber comprising:

(a) a casing defining a bore;

(b) a rod extending within said bore, said rod being supported in said bore for axial movement in either direction from a neutral position;

(c) a pair of bushings slidably mounted within said bore, said bushings being disposed in rest positions at opposite ends of said bore when said rod is in said neutral position;

(d) bushing engagement means for connecting a first one of said bushings to said rod for movement therewith upon movement of the rod in a first direction from said neutral position and connecting the second one of said bushings to said rod for movement therewith upon movement of said rod in the second, opposite direction from said neutral position so that movement of said rod in either direction will displace one of said bushings from its rest position axially inwardly along said bore;

(e) a resilient structure disposed in said bore between said bushings; and

(f) means for fixing said resilient structure to said casing so that upon displacement of said rod in either direction from its neutral position, the bushing connected to said rod will bear on said resilient structure and said resilient structure will oppose such displacement.

4,310,150

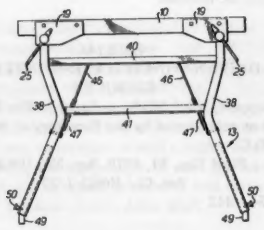
WORKBENCH

Reginald W. D. Andrews, London, England, assignor to Black & Decker Inc., Newark, Del.

Filed Oct. 5, 1978, Ser. No. 948,852

Int. Cl.³ B25B *1/10*

U.S. Cl. 269—139 **1 Claim**



1. A portable workbench comprising:

a generally rigid frame including a spaced apart pair of elongated frame members having respective top surfaces;

a leg structure for supporting said frame above the ground;

a pair of elongated vice members supported from below by said frame and extending transversely to said elongated frame members;

the vice members having respective flat horizontal upper surfaces lying in substantially the same plane to form the complete uppermost working surface of the workbench;

the vice members further having respective, mutually adjacent clamping faces conjointly defining a gap therebetween; and,

a clamping arrangement for moving the vice members apart and together for clamping a workpiece therebetween, the the clamping arrangement including:

a pair of clamping screws for moving one of the vice members relative to the other vice member;

the clamping screws being rotatably mounted in said frame beneath said top surfaces of said elongated frame members;

two nut-like structures threadably engaging respective ones of the clamping screws and having respective pins;

each of the elongated frame members having an elongated opening formed in said top surface thereof directly above the clamping screw therebeneath;

said elongated opening extending in a direction parallel to the longitudinal axis of the clamping screw and defining a track for slideably engaging the nut-like structure and for maintaining the pin thereof in an upward position substantially perpendicular to said plane as the nut-like structure is moved therealong in response to the rotational movement of the clamping screw;

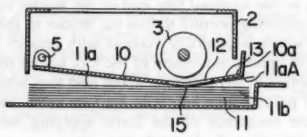
means for confining said nut-like structures to move along the respective tracks in mutually parallel planes fixed with respect to said frame to prevent lateral movement of said nut-like structures within and relative to said respective tracks; and,

aperture means formed in said one vice member for engagement with said pins; said aperture means being two apertures for engagement with respective ones of said pins, at least one of said apertures being an elongated slot thereby causing lateral movement between at least one of said nut-like structures and said one vice member when one of said clamping screws is rotated at a speed different than the other clamping screw whereby said clamping faces conjointly define a tapered gap therebetween.

4,310,151
SHEET FEEDING APPARATUS

Sakae Fujimoto, Chofu, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 825,389, Aug. 17, 1977, abandoned.
This application Jun. 1, 1979, Ser. No. 44,670
Claims priority, application Japan, Aug. 20, 1976, 51/99278; Aug. 20, 1976, 51/99279
Int. Cl.³ B65H *3/06, 3/08, 3/54*
U.S. Cl. 271—11 **9 Claims**



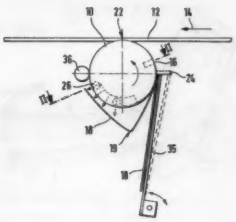
1. In an apparatus for feeding sheets individually from a stack thereof, comprising a suction box adapted to lie over said stack and having a bottom plate having at least one aperture therein, said bottom plate being movable upwardly between a first position adjacent to the uppermost sheet in said stack and a second position lifting from said stack any of said sheets held to said bottom plate by low pressure acting through said at least one aperture in said plate, and at least one roller mounted within said box and each said roller having a portion thereof adapted to extend through a respective aperture for contacting the uppermost of said raised sheets and feeding it forwardly from under said box, the improvement comprising means carried by said bottom plate and adapted to press said stack of sheets at a location spaced rearwardly from the forward end portion thereof for raising the forward end portion of said uppermost sheet for separating it from said stack to attract it to said plate.

4,310,152
STACKER FOR FLAT MATERIAL

Wilhelm Mitzel, Neukeferloh, Fed. Rep. of Germany, assignor to GAO Gesellschaft für Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Jun. 22, 1979, Ser. No. 50,979
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1979, 2909833
Int. Cl.³ B65H *29/00*
U.S. Cl. 271—186 **12 Claims**

1. A stacker for flat material sheets, said stacker having a rotatable stacker drum for tangentially receiving sheets of material from a sheet transport system at a first tangential position and arcuately moving the sheets to a stop at a second tangential position against which a stack is formed, said stacker drum having suction opening means at a predetermined location on the periphery thereof for gripping the leading edges of the sheets at said first tangential position and releasing said sheets at said second tangential position, said stacker drum having air opening means on the periphery thereof positioned behind said suction opening means in the direction of rotation by an amount such that compressed air may be supplied to said air openings and the sheets only after the leading edges thereof have been run up against the stop, said stacker drum having air chamber means parallel to the axis thereof which is joined with

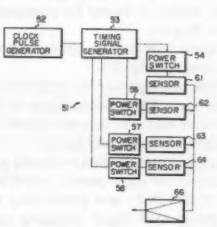


air openings on the exterior of the drum, said air chamber means having an inlet opening on an end face of the drum opposite a base plate and alignable with the outlet of pressure chamber means in the base plate dependent on the angle of turning of said stacker drum so that compressed air is supplied to said air chamber means.

4,310,153
ELECTROSTATOGRAPHIC APPARATUS COMPRISING SHEET SENSORS

Hideo Kikuchi, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 9, 1979, Ser. No. 65,251
Claims priority, application Japan, Aug. 14, 1978, 53-98913
Int. Cl.³ B65H *7/14, 7/20*
U.S. Cl. 271—259 **4 Claims**



1. An electrostatographic apparatus including sheet feed means for feeding a sheet through a sheet feed path, characterized by comprising:

a plurality of sensor means spaced from each other along the sheet feed path for sensing the presence of the sheet adjacent thereto;

circuit means for producing a logical sum output of the sensor means;

timing signal generator means for generating and feeding timing signals to the sensor means at times when the sheet should be present at the sensor means, the timing signals enabling the sensor means respectively;

each sensor means comprising a light source and a photosensor; and

power source means for powering the light source and photosensor;

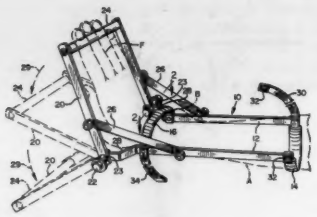
each sensor means further comprising switch means for connecting the light source to the power source means in response to the respective timing signal.

4,310,154

EXERCISING DEVICE FOR THE FINGERS, WRIST AND FOREARM

Peter T. Kauffman, P.O. Box 75, Molalla, Oreg. 97038

Filed Apr. 21, 1980, Ser. No. 113,629
Int. Cl.³ A63B *23/00*
U.S. Cl. 272—67 **4 Claims**



1. An exercising device for the fingers, wrist and forearm comprising

(a) an elongated rigid body having forward and rearward ends,

(b) said body being arranged to receive a person's wrist and a substantial portion of the forearm and including means arranged to anchor it thereon with said forward end disposed in approximately the area of the person's wrist and with said rearward end disposed a substantial distance from the wrist but short of the elbow,

(c) said anchor means having spaced arm anchor points one of which is arranged to extend over a person's arm adjacent the wrist on the side of the arm opposite from the palm of the hand and the other of which is arranged to extend under a person's arm on the same side of the arm as the palm of the hand,

(d) lever means pivotally attached at one of its ends adjacent the forward end of the body on a transverse axis,

(e) laterally extending finger engaging means on the other end of said lever means arranged for engagement with the palm side of the fingers,

(f) and spring means operatively connected between said body and said arm means,

(g) said spring means urging said arm means to a rest position which is angular to the longitudinal plane of said body and resisting rotation of said arm means toward a direction in longitudinal alignment with said body,

(h) said finger engaging means and its normal positioning by said spring means requiring a person when anchoring the arm and wrist to said body and positioning the palm side of the finger tips on said finger engaging means to bend the wrist backward,

(i) said finger engaging means being spaced outwardly on said lever means from said pivot means such that with the fingers in straightened condition only the finger tips of the person's hand engage said finger engaging means,

(j) whereby a person desiring to exercise the fingers, wrist and forearm anchors the arm to said body with the fingers engaged with said finger engaging means and the wrist bent backward and then forces said lever means against said spring means in a pivotal movement toward longitudinal alignment with said body with the finger tips in engagement with said finger engaging means and the fingers always remaining in straightened condition.

4,310,155

SPRING TYPE LOWER LEG MUSCLE EXERCISER

William F. White, Partridge Hill, Williston, Vt. 05495

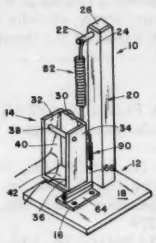
Filed Jun. 20, 1979, Ser. No. 50,137
Int. Cl.³ A63B *21/04*
U.S. Cl. 272—136 **12 Claims**

1. A lower leg muscle exercising apparatus adapted to strengthen the muscles used while skiing, said apparatus comprising:

a generally horizontal base;

a foot holder, having a heel receiving portion, said foot hold being initially oriented in substantially a perpendicular position relative to the base;

joint means interconnecting the heel receiving portion of the foot holder to the base for defining two different axes for permitting compound motion of the foot holder relative to the base about said axes; and



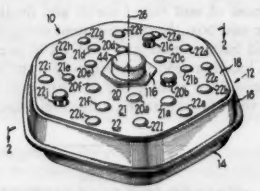
flexible force applying means engaging the foot holder substantially at the terminal free end of the holder opposite the heel receiving portion to bias the holder to the initial position which is generally vertical with respect to said base and to oppose movement of the foot holder from the initial position in any direction about said axes whereby a user may pivot, rotate and hold his foot about said axes against the resistance of the force applying means to thereby strengthen the lower leg muscles.

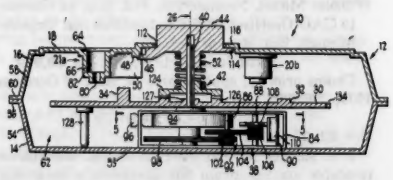
4,310,156

ROUND-ABOUT GAME

Ralph J. Kulesza, Chicago; John R. Wildman, North Riverside, and Burton C. Meyer, Downers Grove, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 9, 1979, Ser. No. 10,833
Int. Cl.³ A63F *9/00*
U.S. Cl. 273—1 GE **4 Claims**





3. A game apparatus comprising:

housing means having a base portion and an upper portion defining a playing surface, said playing surface having receiving means therein,

movable means insertable into said receiving means, said movable means having a first portion which barely pro-

trudes from said playing surface when said movable means is disposed in said receiving means,

platform means rotatably mounted in said housing below said playing surface and having actuating means thereon to selectively contact said movable means, said first portion of said movable means extending out from said playing surface when said actuating means contact said movable means,

drive means mounted on said base portion of said housing means to rotate said platform means below said playing surface,

a rotatable shaft means rotatable by said drive means, a rotatable start means on said playing surface affixed to said shaft means, first ratchet means constrained to rotate with said shaft means and second ratchet means affixed to said rotatable platform means, said first and second ratchet means permitting the rotation of said shaft means in a first circumferential direction while said platform means remains stationary and rotating said platform means in said second circumferential direction when said rotatable shaft means is rotated by said drive means,

start cam means and stop means extending from said playing surface, said start means contacting said start cam means and being lodged between said start cam means and said stop means when said start means is rotated in said first circumferential direction, and

spring means against which said start means may be depressed so as to release said start means from between start cam means and said stop means and permit the rotation of said shaft means in said second circumferential direction by said drive means through substantially 360° until said start means contacts said stop means.

4,310,157

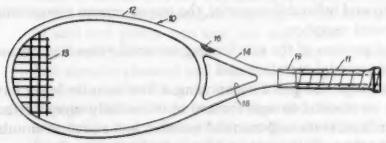
TENNIS RACKET

Louis E. Greenberg, Boulder, Colo., assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 3, 1980, Ser. No. 126,737

Int. Cl.³ A63B *49/10*

U.S. Cl. 273—73 C **1 Claim**



1. A tennis racket comprising a single piece unitary hollow tubular frame constructed from blended graphite-fiberglass composite, said frame comprising a loop portion and a handle portion interconnected by an integral open throat portion, a part of said throat portion comprising a continuation of said loop portion to make said loop portion an enclosed open loop, an outer circumferential stringing groove formed in said loop portion, stringing holes formed in said groove and throat portion part, tennis racket strings extending through said holes lengthwise and crosswise said enclosed open loop, all of said loop, handle and throat portions and said tennis strings being coplanar, said enclosed open loop having an oblong oval shape, said length-wise strings being about 14" long and said crosswise strings being about 8" long whereby the ratio of the length to the width of the inner strung area of said oblong oval shape is about 1.75 to 1, the strung weight of the racket being of the order of 300 to 345 grams, and the overall length of the racket being of the order of 23 to 26 inches.

4,310,158

GOLF CLUB AND GRIP THEREFOR

Walter E. Hoffman, 1 Atchison St., St. Leonards, New South Wales, Australia

Continuation-in-part of Ser. No. 952,426, Oct. 18, 1978, abandoned. This application Nov. 19, 1979, Ser. No. 95,720

Claims priority, application Australia, Oct. 19, 1977, PD2112; Canada, Sep. 25, 1979, 336316

Int. Cl.³ A63B *53/14*

U.S. Cl. 273—81.3 **6 Claims**

1. A golf club comprising a shaft, a head and a grip, said head having a face with a sweet spot, said grip being formed of bendable material and having a bore which includes a plurality of longitudinally-extending portions which are angularly offset relative to the other, said shaft having a straight portion which is homed in the bore to straighten the bore and skew the axis of the outer surface of the grip relative to the shaft, said grip having an outer hand-held surface which has its axis skewed relative to the shaft and directed toward the sweet spot on the face of the club.

6. A method of making a golf club which has a grip with a hand-held outer surface directed toward the sweet spot on the face of the club comprising the steps of providing a straight shaft and a bendable grip, said grip having a bore which includes a plurality of longitudinally extending portions which are angularly offset relative to each other, inserting the straight shaft into the bore to straighten the bore and bend the grip until the axis of the outer hand-held surface of the grip is skewed relative to the shaft and toward the sweet spot on the face of the club.

4,310,159

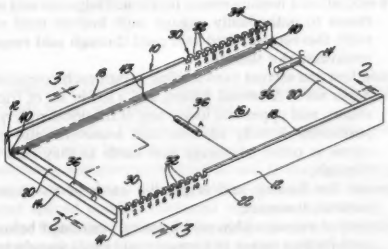
BLOWING GAME INCLUDING ROLLING CYLINDER AND COOPERATING SCORING ZONE

Lawrence W. Wing, 3057 Terry St., Walled Lake, Mich. 48088

Filed May 27, 1980, Ser. No. 153,026

Int. Cl.³ A63B *67/14, 67/00*

U.S. Cl. 273—108 **10 Claims**

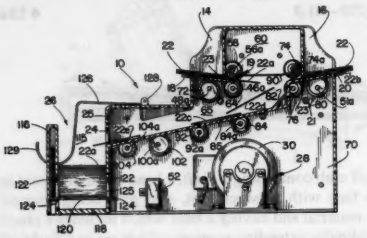


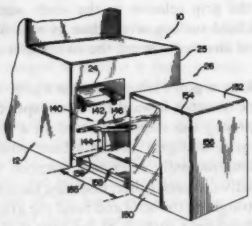
1. A game wherein opposing players roll a cylindrical playing piece into scoring position by blowing at it with their breath, said game comprising a game board and at least one cylindrical playing piece, said board comprising a base having oppositely disposed sides and oppositely disposed ends, retaining means associated only with said sides and scoring means associated only with said ends, said playing piece being formed so as to cooperate with said scoring means.

4,310,160
CARD SHUFFLING DEVICE

Leo Willette, and Betty Willette, both of 3221 W. 135th St., Hawthorne, Calif. 90250

Continuation-in-part of Ser. No. 74,090, Sep. 10, 1979, abandoned. This application Sep. 11, 1980, Ser. No. 186,177
Int. Cl.³ A63F *1/12*
U.S. Cl. 273—149 R 4 Claims





1. An automatic shuffling device for playing cards and the like, comprising:

a housing having a discharge opening with first and second recesses wherein stacks of cards are positioned, said recesses including transverse slots through which individual cards from said stacks can pass;

said housing including an upper shuffling portion to receive said cards from said recesses, and a lower shuffling portion which defines a chute through which said cards traverse to be discharged;

a first card-feeding means positioned adjacent said first recess to individually engage each bottom card of said stack therein, and feed said card through said transverse slot thereof;

a second card-feeding means positioned adjacent said second recess to individually engage each bottom card of said stack therein, and feed said card through said respective transverse slot thereof;

said first and second card-feeding means each comprising an upper set of frictional rollers, and a lower set of frictional rollers, said upper and lower sets of frictional rollers being positioned directly adjacent said transverse slot of said recess in order to engage said cards as they pass therethrough;

means for feeding said respective cards in an alternating sequential manner;

conveyor means within said housing positioned below said card-feeding means to transport said cards singularly from said housing through said discharge opening thereof, said conveyor means comprising a plurality of frictional rollers positioned within said chute to engage said cards as they pass from the upper portion to the lower portion of said housing;

a card rack located adjacent said discharge opening to receive said cards in a shuffled and stacked arrangement;

said card-rack means comprising a movable closure adapted to slide in and out of said housing adjacent said discharge end of said chute, and a floating card carriage pivotally secured to said housing and adapted to be positioned in said movable closure when said cards are being stacked thereon;

said floating card carriage comprising an elongated arm member pivotally secured within said housing and positioned to extend outwardly therefrom, and a flat tray mounted to the end of the extended portion of said elongated arm member thereof;

means for biasing said card carriage in an upward position, allowing said card carriage to move downwardly as said cards are stacked thereon;

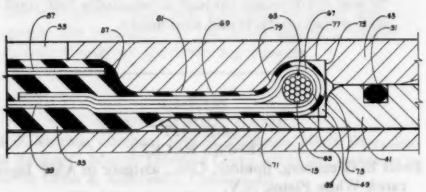
sliding means formed between said housing and said movable closure;

means to automatically operate said first and second feed means and said conveyor means comprising a motor means, a gear-train system operably connected to said motor means, and a pulley system connected to and operated by said gear system, whereby said gear system and said pulley system are operably interconnected to said feeding means and said conveyor means.

4,310,161
INFLATABLE PACKER ELEMENT

Steven G. Streich, Duncan, Okla., assignor to Halliburton Services, Duncan, Okla.

Filed Jun. 15, 1979, Ser. No. 48,982
Int. Cl.³ F16J *15/46*
U.S. Cl. 277—34 9 Claims



1. An improved well packing device of the type having a section of inflatable material for expansion upon inflation, the inflatable material being reinforced with a reinforcing material, the device further having at least one annular end piece attached to said inflatable material, the improvement comprising:

a toroidal member;

an end portion of the reinforcing material extending around said toroidal member; and

said annular end piece comprising a first annular body having an annular trough formed in its radially inner surface which receives said toroidal member and a second annular body the radially outer surface of which extends adjacent said first annular body enclosing said trough and forming a slot which extends axially from said trough and through which the reinforcing material extends, said slot being sufficiently narrow to prevent said toroidal member from moving therethrough such that said end portion of the reinforcing material is retained with respect to said first and second annular bodies.

4,310,162
HIGH PRESSURE LIP SEAL

William F. Donovan, Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 19, 1980, Ser. No. 122,631
Int. Cl.³ F01B *19/00;* B65D *53/04*
U.S. Cl. 277—103 3 Claims

1. A pressure seal for sealing a vessel against passage of pressurized fluid out of a cavity formed in said vessel by the

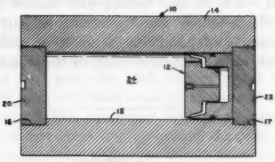
cooperation of said vessel with at least one end closure, said seal comprising;

a seal carrier means slidably disposed within said cavity adjacent said end closure, said seal carrier defining means for isolating said end closure from pressures developed within said cavity and including,

a seal body having a bore formed therein,

a primary sealing means disposed between said seal body and the wall of said cavity,

a seal piston reciprocably received within said bore of said seal body, said seal piston including a tapered surface for engaging the surface of said bore of said seal body in response to displacement of said seal piston inwardly of said bore of said seal body and further for displacing at least a portion of said seal body outwardly into surface-to-surface contact with said wall of said cavity in response to generation of pressures within said cavity and against said seal piston, said displacement of said portion of said seal body into surface-to-surface contact with said wall of said cavity defining a secondary seal whereby to preclude passage of fluid into the space defined by the outer surface of said seal body and the inner surface of said cavity, wherein



(a) said primary sealing means comprises an O-ring seal disposed in an annular channel formed in the outer surface of said seal body, said O-ring means being in surface-to-surface engagement with said seal body and with said wall of said cavity,

(b) at least a portion of said bore of said seal body is tapered at an angle substantially corresponding to said tapered surface of said seal piston such that said tapered surface of said bore of said seal body engages said tapered surface of said seal piston during displacement of said seal body into said secondary sealing condition,

(c) said seal piston cooperates with said bore to said seal body to define a cavity containing a liquid therein, said liquid being compressed in response to the displacement of said seal piston into said seal body, and

(d) said seal piston includes a first O-ring contained in a first annular channel and a second O-ring contained in a second annular channel, said O-rings being in surface engagement with the seal piston and the bore of said seal body, and a first vent passage extending from the front end surface of said piston to the outer surface thereof between said O-rings for equalizing the fluid pressure across each of said O-rings.

4,310,163

ANTI-EXTRUSION SEALS AND PACKINGS

Aaron J. Pippert, Houston, Tex., assignor to Utex Industries, Inc., Houston, Tex.

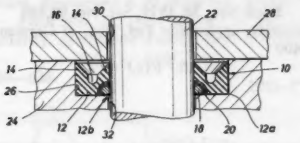
Filed Jan. 10, 1980, Ser. No. 110,937
Int. Cl.³ F16J *15/18*
U.S. Cl. 277—188 A **20 Claims**

1. An anti-extrusion sealing device including a base area having a corner portion, and a sealing area distal said corner portion and having at least one sealing surface disposed on the same side of said device as said corner portion, said sealing device being comprised of:

a main body section defining said sealing area and comprised of a flexible material,

a secondary anti-extrusion section adjoined to the exterior of said main body section and defining two exterior surfaces converging in said corner portion, said secondary anti-extrusion section being comprised of a material more rigid than that of said main body section;

and a primary anti-extrusion section embedded in said sec-



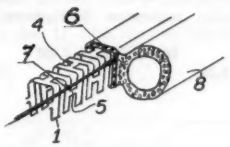
ondary anti-extrusion section at said corner portion adjacent said two exterior surfaces thereof but substantially covered by said secondary anti-extrusion section, said primary anti-extrusion section being comprised of a metallic material more rigid that that of said secondary anti-extrusion section.

4,310,164

COMPOSITE REINFORCED SEALING STRIP

Francois Mesnel, Neuilly-sur-Seine, France, assignor to Etablissements Mesnel, Carrieres-sur-Seine, France

Filed Nov. 21, 1979, Ser. No. 96,316
Claims priority, application France, Mar. 30, 1979, 79 08136
Int. Cl.³ F16J *15/12*; E06B *7/16*
U.S. Cl. 277—189 **24 Claims**



1. A composite reinforced sealing strip, for use for example on a vehicle body, said strip comprising:

a sealing part and a U-shaped gripping part integrally connected together lengthwise thereof;

a reinforcing armature embedded in said U-shaped gripping part and comprising: a body formed of a series of like-oriented spaced parallel U-shaped elements each having a central bight and two legs depending therefrom, connecting struts joining only the bights of the two elements of consecutive pairs of elements and further connecting struts joining only the adjacent legs of said consecutive pairs of elements, whereby the first and second elements of every three consecutive elements are joined together solely at the bight and the second and third elements are joined together solely at the legs, and

an elongated substantially inextensible member embedded between said parts to extend longitudinally thereof.

4,310,165

ELASTOMERIC PACKING FOR A CLAMPED CONNECTION

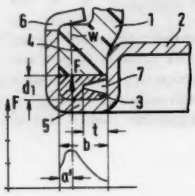
Hans Martin, Stuttgart, and Kurt Scharpf, Moensheim, both of Fed. Rep. of Germany, assignors to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Nov. 30, 1979, Ser. No. 98,840

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1978, 2852409

Int. Cl.³ F16J *15/42*

U.S. Cl. 277—205 12 Claims



1. A fluid-tight sealed connection, comprising

a first member having a flange portion;

a packing member; and

a second member having a recess adapted for receiving said packing member and the flange portion of said first member, said recess having an edge portion which is deformed about the flange portion of said first member to hold said first and second members in compressive force contact with said packing member, wherein said packing member comprises an elastomeric packing comprising a generally solid cross section having a recess therein for absorbing deformation of the packing due to the compressive force, said recess being located asymmetrically with respect to the resultant of the compressive force.

4,310,166

TRANSPORT APPARATUS ESPECIALLY FOR GOODS, CAPABLE OF TRAVELLING OVER STAIRS

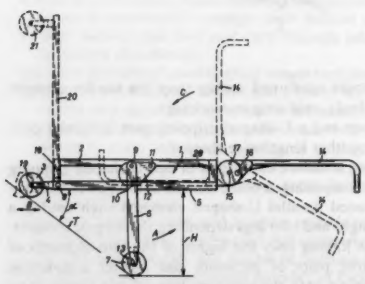
Josef Eicher, Balgach, Switzerland, assignor to Cabo AG, Widnau, Switzerland

Filed Jun. 4, 1979, Ser. No. 72,005

Claims priority, application Switzerland, Sep. 5, 1978, 9325/78

Int. Cl.³ B62B *5/02*

U.S. Cl. 280—5.28 7 Claims



1. A transport apparatus comprising: loading bridge means (1) including a floor (5) and a frame (2) surrounding said floor, at least two front roller means (3) and at least two rear roller means (7), load bearing arm means (6) extending downwardly from each side of the loading bridge means (1), means pivotally mounting said load bearing arm means to said loading bridge means within approximately the middle third of the length of the loading bridge means (1), for angular movement of the load bearing arm means (6) over at least approximately 90° between a downward position at substantially right angles from the loading bridge means and an upward storage position, said rear roller means (7) being mounted at the outer ends of said load bearing arm means (6), at least two lever arm means mounted at the front end of the loading bridge means and extendable and retractable from the front end of the loading bridge means substantially in parallel relative to the floor (5) of said loading bridge means (1), said respective lever arm means being separately individually extendable and retractable, said front roller means (3) being mounted at the ends of said respective lever arm means, said loading bridge means being oriented at an angle with the ground directed upwardly toward the rear when the transport apparatus is placed on a horizontal surface, and wherein the spacing (a) between the front and rear roller means (3,7) and the diameter of the roller means are so selected that upon transport up a set of stairs (22) the front roller means (3) come to rest on an upper stair tread while the rear roller means (7) may simultaneously rest on a lower stair tread, at least two handle arm means (14) mounted at the rear end of the frame (2), each of said handle arm means being separately individually pivotable about a horizontal axis (15) and means for arresting said handle arm means in different positions, thereby to facilitate maneuvering of the transport apparatus.

4,310,167

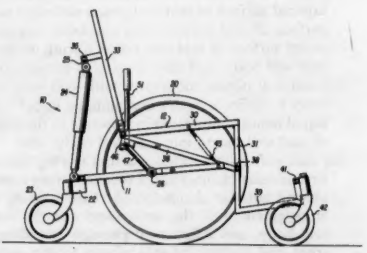
CENTER OF GRAVITY WHEELCHAIR WITH ARTICULATED CHASSIS

Colin A. McLaurin, Charlottesville, Va., assignor to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Filed May 15, 1980, Ser. No. 150,148

Int. Cl.³ B62B *9/02;* B62M *1/00*

U.S. Cl. 280—5.28 8 Claims



1. A center of gravity wheelchair, comprising:

an articulated chassis having a subframe to which is mounted a pair of main wheels and a rear caster wheel, and a seat frame assembly carrying a seat and a front caster wheel and connected to the subframe for movement relative thereto between a first position with the seat positioned over the main wheels and a second position forwardly of the main wheels to facilitate curb climbing;

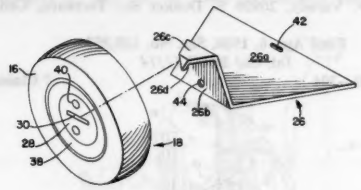
said main wheels and front and rear caster wheels being arranged in a diamond pattern whereby lateral drift of the wheelchair is minimized while traversing sloping surfaces; and

resiliently yieldable means connected between the subframe and seat frame assembly to minimize the tendency for the front caster wheel to lift off the ground when the main wheels are strongly propelled, and to provide shock absorption when traversing rough ground.

4,310,168
PNEUMATIC WHEEL SKATE DEVICE

Mary H. Macaluso, 741 Lee Dr., Las Vegas, N. Mex. 87701

Filed Feb. 8, 1980, Ser. No. 119,883
Int. Cl.[3] A63C *17/08*
U.S. Cl. 280—11.24 10 Claims



1. A skate device adapted for attachment to a foot and designed to provide ease and safety of movement for walking, running, coasting and standing comprising:

(a) a molded plastic form adapted to fit about the foot;

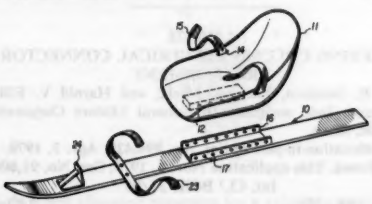
(b) a triangular plate mounted under the plastic form, said plate extending beneath the sole of the foot along the center of the arch and positioned so that its base is at the inside of the foot near the arch and its point is at the outside of the foot; said plate configured so as to comprise a main horizontal part extending beneath the sole of the foot, a vertical part extending upward at the outside of the foot approximately perpendicular to said main part, and a portion containing the point extending outward from said vertical part; and

(c) a pneumatic wheel adapted to rotate about a fixed center, the point of said triangular plate passing through an aperture in the fixed center so as to secure the wheel to the plate.

4,310,169
SKI DEVICE FOR SLEDDING

Richard G. Brough, 825 Whitemaple Way, Salt Lake City, Utah 84106

Filed Sep. 7, 1979, Ser. No. 73,506
Int. Cl.[3] B62B *13/00*; A63C *5/00*
U.S. Cl. 280—12 K 7 Claims



1. A sledding ski including both a seat and a foot rest wherein

(a) opposed track means extend the width of the ski on the rear portion of said ski beyond its medial length, and

(b) wherein said track means has vertically extended edge portions containing a series of equidistant aligned opposed openings, and

(c) a bucket seat sitting directly on said track means and being provided on its underside with spring urged shoulder button means engageable in said openings as a stop means for locating the seat in accordance with the height of a user, and

(d) strap means threaded thru opposed slits located in the sides of said seat to cross over the abdomen of a user, and

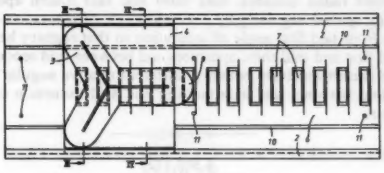
(e) heel stop means located at the forward end of the ski, and

(f) strap means intermediately located between said seat and said foot rest to bind the legs of a user.

4,310,170
CROSS-COUNTRY SKI BINDING

Josef Linecker, Rosengasse 5, Mattighofen, Austria

Filed Nov. 28, 1979, Ser. No. 97,882
Claims priority, application Austria, Dec. 4, 1978, 8663/78
Int. Cl.[3] A63C *9/00*
U.S. Cl. 280—636 5 Claims



1. A cross-country ski binding for use with a ski shoe having a recessed sole area, the binding comprising

(a) a substantially plate-like guiding part affixed to the ski and having an upper surface extending longitudinally along the ski, the upper guiding part surface defining

(1) a plurality of transversely extending depressions,

(b) a bearing plate of elastic material longitudinally slidably mounted on the guiding part, the bearing plate including

(1) a projection matching the depressions for selectively engaging a respective one of the depressions for retaining the bearing plate in a selected longitudinal position relative to the guiding part, and

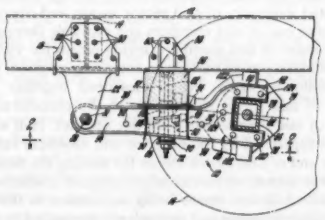
(2) an extension projecting longitudinally beyond the bearing plate and having an underside rising from the upper surface of the guiding part, and

(c) a heel part arranged on the bearing plate and having a raised portion matching the recessed sole area for engagement therewith.

4,310,171
VEHICLE AXLE ATTACHMENT

Ralph H. Merkle, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 11, 1980, Ser. No. 158,397
Int. Cl.[3] B60G *1/00*
U.S. Cl. 280—688 3 Claims



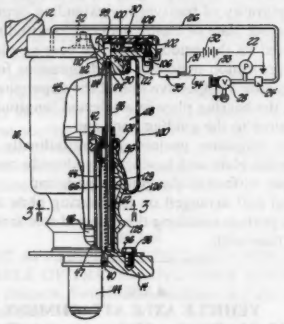
1. In a suspension system for a vehicle having a sprung mass portion, an unsprung mass portion, and spring means disposed between said sprung and said unsprung mass portions, said unsprung mass portion including an axle housing disposed transversely of said vehicle and an axle excursion control means attached to said sprung mass portion for pivotal movement about a first generally transverse axis of said vehicle, the combination comprising, means connecting said axle housing to said excursion control means for relative pivotal movement about a second generally transverse axis of said vehicle, means

defining a first aperture in a planar surface of said axle housing perpendicular to said second axis at a first radial distance from said second axis, means defining a second aperture in said axle housing planar surface at a second radial distance from said second axis, said first and said second aperture being spaced angularly by a first angle of separation, means on said excursion control means defining a third aperture in a planar surface perpendicular to said second axis at a radial distance from said second axis equal to said first radial distance, and means defining a fourth aperture in said excursion control means planar surface at a radial distance from said second axis equal to said second radial distance, said third and said fourth apertures being spaced angularly by a second angle of separation different from said first angle of separation so that registry between said first and said third apertures and between said second and said fourth apertures occurs at different relative angular orientations between said axle housing and said excursion control means.

4,310,172
POSITION CONTROL SYSTEM

George T. Claude, Bellbrook, and Jerry W. Burns, Jamestown, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 23, 1979, Ser. No. 32,698
Int. Cl.³ B60G *21/00*
U.S. Cl. 280—703 **6 Claims**

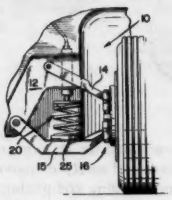


1. A control system for adjusting the relative position of two members relatively movable with respect to one another comprising motor means operatively disposed between and interconnecting said members for movement toward and away from one another, follower means having telescoping parts mounted internally of said motor means and operatively connected to one of said members and movable therewith relative to the other of said members, spring means for yieldably holding said telescoping parts in an extending position, said parts of said follower means being telescoped together against the force of said spring in response to the predetermined movement of said members toward one another, Hall effect device means supported by the other of said members externally and at one end of said motor means for sensing the position of said follower means, an electrically energized control circuit, said Hall effect device means being responsive to the position of said follower means and operatively connected to said control circuit for triggering said circuit to produce pre-determined electrical signals, energizable activator means operatively connected to said control circuit and responsive to said predetermined electrical signals for activating said motor means for moving said members away from one another in response to the positioning of said follower means at a first position with respect to said Hall effect device means and to further effect movement of said members toward one another in response to the positioning of said follower means at a second position with respect to said Hall effect device means, and said first and second positions being at a pre-determined distance from one another to define a zone in which said motor means is free of activation by said circuit and said activator means.

4,310,173
HYDRAULIC-ACTUATING DEVICE FOR MOTOR VEHICLES

Theodore F. Varady, 20938 S. Denker St., Torrance, Calif. 90501

Filed Apr. 8, 1980, Ser. No. 138,353
Int. Cl.³ B60G *11/14*
U.S. Cl. 280—704 **7 Claims**



1. A hydraulic-actuating device for use in the front and/or rear ends of vehicles, to cause said vehicles to bounce off the ground surface when selectively actuated through a combination hydraulic and electrical system, wherein the device comprises:

a hydraulic cylinder wherein one end is adapted to receive hydraulic fluid, said cylinder being mounted for movable engagement with the vehicle frame member;

a piston head slidably disposed within said cylinder;

a piston rod connected to said piston head, and extending from one end of said cylinder;

a cap member mounted to said cylinder to seal and restrain said piston head in said cylinder;

a bushing member secured between said cap member and said cylinder end;

a restraining means interposed between said cap member and said vehicle frame member, thereby restraining the movement of said cylinder in one direction;

a support-plate member adapted to engage said piston rod; and

a coil-spring member interposed between said plate member and the suspension assembly of said vehicle.

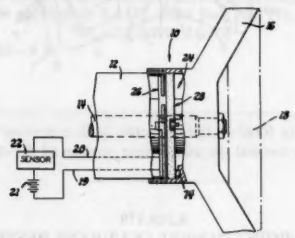
4,310,174
STEERING COLUMN ELECTRICAL CONNECTOR ARRANGEMENT

Arthur R. Sundeen, Lansing, Mich., and Harold V. Elliott, Syracuse, Ind., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 894,428, Apr. 7, 1978, abandoned. This application Nov. 6, 1979, Ser. No. 91,800
Int. Cl.³ B60R *21/08*
U.S. Cl. 280—731 **2 Claims**

1. In combination with a motor vehicle steering assembly including a steering column member rotatably supporting a steering shaft fixed with a steering wheel having an occupant restraint cushion, said vehicle having a sensor for actuating said occupant restraint cushion, an electrical connector arrangement interposed between said steering column member and said steering shaft for allowing relative movement therebetween while continuously providing electrical continuity between said sensor and said occupant restraint cushion, said electrical connector arrangement comprising a stationary insulator member carried by said steering column member; a pair of concentric conductor rings mounted on said insulator member and adapted to be electrically connected to said sensor; a heater element corresponding in shape and size with said conductor rings and being located between said insulator member and each of said conductor rings; an electric circuit including

a battery and a switch for energizing said heater element, the resistance of said heater element being such the power output thereof is only sufficient to maintain said conductor rings a few degrees warmer than the temperature of said insulator member and said steering assembly so that during the time that the temperature of said steering assembly, said insulator member and said conductor rings is below 32° F., introduction of high-humidity air into the air space surrounding said electrical



connector arrangement causes said steering assembly and said insulator member to remove the moisture from said air space and thereby prevents frost from forming on said conductor rings; and a pair of flexible contact members fixed with said steering shaft for continuously maintaining engagement with said conductor rings during rotation of said steering shaft so as to provide electric current to said occupant restraint cushion upon operation of said sensor.

4,310,175

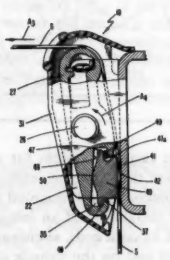
BELT CLAMPING APPARATUS WITH SELF-ALIGNING FEATURE

David A. Pickett, Warren, Mich., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 19, 1980, Ser. No. 122,213

Int. Cl.³ A62B *35/02*

U.S. Cl. 280—801 **5 Claims**



1. In a belt clamping apparatus for a vehicle wherein a seat belt is moveable in a first direction to allow engagement with an occupant of the vehicle and in an opposite second direction to allow retraction, said clamping apparatus resisting movement of said belt to restrain the occupant when a force above a predetermined amount is applied to said belt in said first direction, said clamping apparatus including a lever pivotable on a shaft, mounting means for said shaft, said lever having a clamping position and a non-clamping position, and means for biasing said lever to said non-clamping position, the improvement comprising:

a clamp bar carried by said lever having a first clamping area for contacting a portion of said belt and clamping said belt against a corresponding second clamping area on said mounting means, means for retaining said clamp bar on said lever; and

universal rocking means between a first surface on said clamp bar on the opposite side of said bar from said first clamping area and a second corresponding facing surface on said retaining means, said universal rocking means providing substantially point contact between said clamp bar and said lever, said clamping bar being universally moveable by said rocking means to apply a substantially uniform clamping force in all directions over the full area of contact with said belt.

4,310,176

SEAT BELT LOCKING DEVICE FOR AN AUTOMOBILE VEHICLE

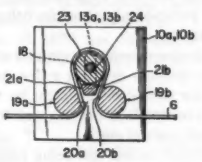
Takeshi Furusawa, Fujieda, and Yoshimi Yamamoto, Shizuoka, both of Japan, assignors to Fuji Kiko Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1980, Ser. No. 150,267

Claims priority, application Japan, Aug. 31, 1979, 54-119949[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—801 **8 Claims**



1. A seat belt locking device for an automobile vehicle comprising:

(a) a housing;

(b) a locking member having first and second askew surfaces defining a truncated wedge, mounted within said housing about a locking member shaft, said shaft being slidably mounted within said housing;

(c) a roller, rotatably positioned on said locking member shaft;

(d) first and second stationary shaft members, each having a lengthwise flat surface thereon, each of said shaft members being fixedly mounted within said housing equidistant from a line defined by the movement of said locking member shaft such that respective said stationary shaft member flat surfaces are positioned adjacent respective locking member askew surfaces; and

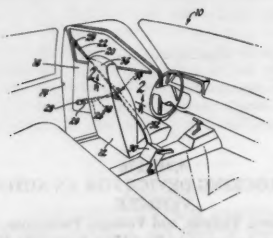
(e) means for urging said locking member in a direction away from said stationary shaft members,

whereby a safety belt passing into said device, between said first stationary shaft member flat surface and said first locking member askew surface, around said roller, between said second stationary shaft member flat surface and said second locking member askew surface, and out of said device, is caused to be gripped between respective stationary shaft member flat surfaces and locking member askew surfaces upon the application of sufficient tension to said safety belt to overcome the force exerted by said urging means to permit said locking member to be urged toward said respective stationary shaft member flat surfaces in response to the application of sufficient tension applied to said safety belt.

4,310,177
LOCKING JUNCTION RING FOR CONTINUOUS-LOOP PASSIVE SEAT BELT SYSTEM

Lloyd W. Rogers, Jr., Utica, and Robert L. Stephenson, Sterling Heights, both of Mich., assignors to General Motors Corp., Detroit, Mich. and Allied Corporation, Morristown, N.J.

Filed Jul. 16, 1979, Ser. No. 57,605
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—802 **4 Claims**



1. In combination with a vehicle seat belt system including a continuous-loop belt having ends mounted on one side of the vehicle seat and an anchor belt having a first end mounted on the other side of the seat and a second end, a junction device adapted to couple the second end of the anchor belt with the continuous-loop belt and to divide said continuous-loop belt into a lap belt portion and a shoulder belt portion, said junction device comprising:

a ring-like frame member having an elongated central belt receiving aperture defining a first belt load bearing wall adapted for sliding engagement by the continuous loop-belt and a second load bearing wall for engagement by the anchor belt second end;

said anchor belt second end being enlarged to prevent passage of the anchor belt second end through the frame member aperture so that the continuous-loop belt and the anchor belt are effectively coupled;

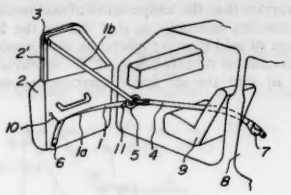
the imposition of oppositely directed occupant restraining loads on the continuous-loop belt and the anchor belt during emergency induced vehicle deceleration causing the enlarged anchor belt second end to simultaneously engage against the second bearing wall and the continuous-loop belt to forcefully clamp the continuous-loop belt against sliding movement along the first load bearing wall whereby the lengths of the lap and shoulder belt portions are fixed relative one another.

4,310,178
THREE POINTS PASSIVE SEAT BELT ASSEMBLY

Yoshimi Sato, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 14, 1979, Ser. No. 103,578
Claims priority, application Japan, Dec. 21, 1978, 53-177211[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—802 **3 Claims**

1. A three point passive seat belt assembly for a vehicle comprising a first belt extending from an upper rear portion of a door sash of the vehicle to a lower rear portion of the door, and having a shoulder belt portion and a lap belt portion, a second belt having at its one end a through-ring through which the first belt extends, a retractor exerting a force holding the other end of the second belt at a center portion of the vehicle, and pull means which, upon application of a force smaller than

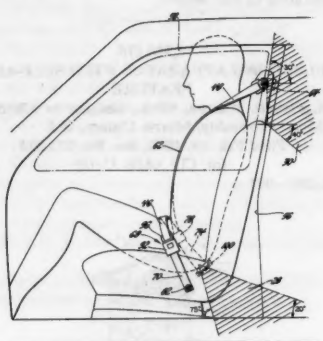


the retracting force of the retractor, pulls a portion of the lap belt portion toward the center rear portion of the door.

4,310,179
THREE-POINT PASSIVE OCCUPANT RESTRAINT SYSTEM

James A. Winnale, Warren; Lloyd W. Rogers, Jr., Utica; Edward E. Compeau, Fraser, and Albert E. Billis, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 19, 1979, Ser. No. 77,142
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—803 **3 Claims**



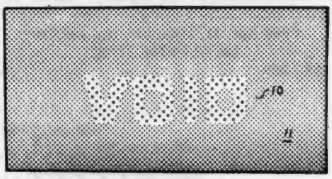
1. In an occupant restraint system for a vehicle having a door laterally adjacent the occupant seating position, a shoulder belt having an outboard end mounted on the vehicle outboard the occupant shoulder and an inboard end, a lap belt having outboard and inboard ends, anchorage means mounting the outboard lap belt end on the vehicle door, a control belt connected to the inboard ends of the lap and shoulder belts, retractor means mounted inboard the occupant seating position and having a reel for winding the control belt when the door is closed to establish the lap belt across the lower torso and the shoulder belt diagonally across the upper torso, the imposition of occupant restraint loads on the lap and shoulder belts causing the control belt to spool-down on the reel and thereby extend the effective restraining length of the lap and shoulder belts at their inboard ends; the improvement comprising:

said anchorage means mounting the outboard lap belt end on the vehicle door being located forward of the mounting zone specified by Motor Vehicle Safety Standard 210 whereby the cooperation with control belt spool-down on the retractor reel, the occupant lower torso and upper torso are permitted limited forward excursion from the seating position in a generally upright position to limit forward rotation and excursion of the head.

4,310,180
PROTECTED DOCUMENT AND METHOD OF MAKING SAME

William H. Mowry, Jr., Ionia; Michael J. McElligott, Rochester; Victor J. Tkalenko, Jr., Rochester, and Joseph Baran, Rochester, all of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 798,219, May 18, 1977, Pat. No. 4,265,469, and a continuation of Ser. No. 958,928, Nov. 8, 1978, abandoned. This application Jul. 23, 1980, Ser. No. 171,318
Int. Cl.[3] B42D *15/00*
U.S. Cl. 283—8 B 1 Claim



1. A method of making copy-proof document which prevents exact duplication of said document by causing the copy of said document to indicate its lack of orginality, said method comprising the steps of:

applying a first less than full tone background color image to the original document substrate in a form which denotes its invalidity, which first image is composed of dots of a size which are reproducible by a color copying machine such as the Xerox model 6500 or the like;

next, applying a second less than full tone background color image to the original document substrate in those areas of the original document substrate not covered by said first image, which second image is composed of dots of a size which are not reproducible by said copying machine;

finally, applying a third background color camouflage random image over the entire area of the original document substrate, which third camouflage random image substantially masks the invalidity form of the first color image on the original document and which is also not reproducible by said copying machine to thereby provide an original document in which any sign of invalidity is substantially invisible, but which sign of invalidity is noticeably reproduced upon any color copy of said original document.

4,310,181
LOAD-LINE FASTENER

James W. Welsh, 1350 Loring St., San Diego, Calif. 92109, and Robert A. Anderson, 1481 Anita St., Carpenteria, Calif. 93013

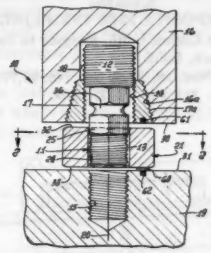
Filed Dec. 7, 1979, Ser. No. 101,204
Int. Cl.[3] F16L *35/00*
U.S. Cl. 285—4 16 Claims

1. In a fastening assembly, the combination comprising

(a) an axially elongated fastener having axially spaced differentially threaded portions respectively adapted to threadably engage threaded extents on members

(b) means at the side of the fastener characterized as facilitating transmission of torque to the fastener to rotate the fastener about said axis whereby said threaded portions are then adapted to threadably interfit said threaded extents to make-up the assembly,

(c) and including one of said members defining an internal recess sunk into the member from an external face thereof, and an annular insert retained in the recess, said insert defining internal threaded extent threadably engaged by one of said fastener threaded portions, the recess having an interior portion spaced further from said member external face than the overall axial length of said one threaded portion of the fastener, said one threaded portion also extending into said recess interior portion whereby upon rotation of the fastener to make-up the members the entirety of said one threaded portion of the fastener will be displaced toward said external face but will remain in said recess, p1 (d) said means including shoulders on said fas-

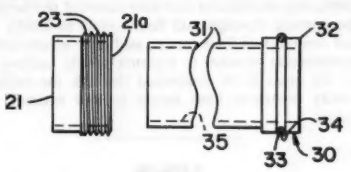


tener, said shoulders extending generally axially, the fastener maximum diameter at said shoulders being less than the maximum diameter of said one threaded portion of the fastener.

4,310,182
INTERNAL COUPLINGS FOR PLASTIC SOLAR COLLECTORS AND THE LIKE

Benjamin E. Vandenbossche, Hillsborough, Calif., assignor to Sealed Air Corporation, Saddle Brook, N.J.

Filed Jun. 15, 1979, Ser. No. 48,726
Int. Cl.[3] F16L *35/00*; B65D *51/00*; F16L *41/04, 55/00*
U.S. Cl. 285—40 6 Claims



1. In combination, a plastic manifold for a solar collector panel, said manifold including an open end and a counterbore formed in said open end to provide an internal shoulder within said manifold; and an internal fitting removeably received in said counterbore of said manifold for controlling fluid flow therethrough, said internal fitting including a first member positioned in said counterbore of said manifold for axial movement relative thereto, said first member having a first external surface located interiorally of said manifold and first permitting means for permitting fluid to pass through said first member, a second member fixedly positioned in said counterbore of said manifold, said second member having a second external surface positioned between said first external surface of said first member and said open end of said manifold and second permitting means for permitting fluid to pass through said second member, said second permitting means being in fluid communication with said first permitting means so that fluid can flow through said fitting and hence through said open end of said manifold, sealing means provided on said first external surface of said first member for forming a fluid-tight seal between said first external surface of said first member and an internal surface of the counterbored portion of said manifold, connecting means provided on said first member for connecting said fitting to a conduit, said connecting means passing through said second member, and thread-cutting means provided on said second external surface of said second member for cutting internal threads in said manifold, said thread-cutting means cooperating with the internal threads cut by said

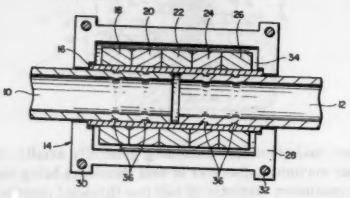
thread-cutting means to fixedly position said second member in said counterbore of said manifold, whereby said second member prevents the inadvertent removal of said first member from said open end of said manifold.

4,310,183

COMPOSITE PIPE COUPLING

Laszlo Szalvay, San Carlos, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Nov. 28, 1979, Ser. No. 97,779
Int. Cl.³ F16Z *35/00*
U.S. Cl. 285—114 **6 Claims**



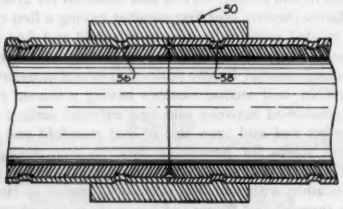
1. A composite pipe coupling comprising:
(a) a liner means having an opening therethrough capable of receiving the ends of the pipes to be connected;
(b) driver means of heat-recoverable metallic material having an opening therethrough mounted concentrically around said liner means, said driver means constricting radially inwardly upon heat recovery to grip and radially contain said liner means into a sealing condition with pipes to be connected; and
(c) external support means having an opening therethrough mounted concentrically around said driver means and contacting each end of said liner means at the periphery of the opening through said liner means to axially support and contain said liner means, said liner means acting as a compression member to transmit tensile loading created by the pipes to be connected through the radially and axially contained liner means to said external support means.

4,310,184

POLYOLEFIN PIPE CONNECTOR SLEEVE

Steve Campbell, Manchester, Mo., assignor to Pipe Systems, Incorporated, Fenton, Mo.

Filed Apr. 28, 1980, Ser. No. 144,668
Int. Cl.³ F16L *33/00, 21/06*
U.S. Cl. 285—238 **8 Claims**



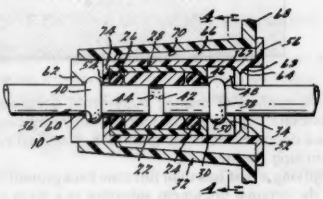
1. A connector sleeve device for connecting butted polyolefin pipe ends together by a coupling, said device comprising a tube-like metallic connector sleeve having a plurality of circumferential axially spaced internal ribs and external grooves in registry with one another, a polyolefin pipe end having a plurality of circumferential grooves, said metallic sleeve being press fitted over said pipe end with said ribs being fitted within said pipe grooves in mating relation and outer ends of said sleeve and pipe end being in registry with one another, said pipe end and connector sleeve being coupled to a like butted pipe end and connector sleeve by a sleeve like coupling having internal circumferential rib means engageable with the end most grooves in said butted connector sleeves and having an interior circumferential surface engageable in mating relation with the entire exterior circumferential surfaces of said metallic sleeves at the butted end portions thereof between said end most grooves.

4,310,185

QUICK CONNECTOR FOR TUBING

Donald D. Bartholomew, 5771 McKinley, Marine City, Mich. 48039

Filed Apr. 21, 1980, Ser. No. 142,010
Int. Cl.³ F16L *17/02*
U.S. Cl. 285—369 **14 Claims**



1. A quick connector for splicing tubing comprising:
an inner tubular sleeve adapted to fit coaxially over axially aligned opposed tubing end portions;
a pair of sealing rings, one positioned adjacent each axial end of said inner tubular sleeve, one of said pair adapted to fit over one of said tubing end portions, the other of said pair adapted to fit over the other of said tubing end portions;
an inner clamping sleeve fit closely over said inner tubular sleeve and said sealing rings, said inner clamping sleeve having a generally tubular shape and having means for removably attaching to the one of said tubing end portions;
an outer clamping sleeve fit closely over said inner clamping sleeve and having means for removably attaching thereto, said outer clamping sleeve having a generally tubular shape and having means for removably attaching to the other of said tubing end portions; and
a locking sleeve coaxially positioned over said outer clamping sleeve, said locking sleeve having a generally tubular shape and having means for removably attaching to said outer clamping sleeve.

4,310,186

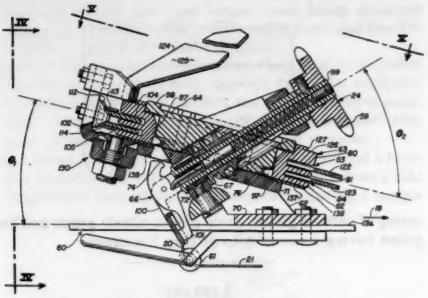
KNOTTER APPARATUS

Marc G. Vansteelant, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

Filed Jun. 20, 1980, Ser. No. 161,628
Claims priority, application United Kingdom, Jun. 22, 1979, 21876/76
Int. Cl.³ B65H *69/04*
U.S. Cl. 289—14 **10 Claims**

1. A knotter apparatus comprising:
a twine holder including a plurality of spaced apart rotating twine discs defining a plurality of grooves between the discs, said grooves having a first depth;
said discs further defining a plurality of adjacent sets of notches, said notches having a second depth less than said first depth; and
means for increasing the length of a portion of twine looped

through one set of said notches and through an adjacent set of said notches, said means being one of said discs



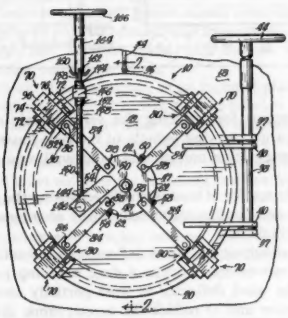
having a thickness substantially greater than the thickness of each other disc.

4,310,187

DOOR SECURING MECHANISM

Jeffrey A. Loy, Newville, Pa.; Albert H. Goetsch, Clinton, Wis., and John W. Lahman, West Chester, Pa., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 14, 1979, Ser. No. 94,343
Int. Cl.³ E05C *9/16*
U.S. Cl. 292—56 **15 Claims**



1. A door securing mechanism for latching a door to a door frame having an annular flange with compressive seal means comprising a plurality of generally C-shaped clamps having a pair of spaced apart generally parallel legs and an interconnecting base and carried by the door for movement between a retracted position and a latching position wherein a first one of the clamp legs of each clamp engages behind said annular flange and the second clamp leg of each clamp overlies a face of the door with the interconnecting base spanning said door and flange, and wedge means movable between the second clamp legs and the door face to exert a force in a direction to compress the door and frame together.

4,310,188

MAGNETIC SWITCH FOR ATTRACTIVE LATCH

Yoshihiro Aoki, No. 9-16, 2 chome, Hanahata Adachi-ku, Tokyo, Japan

Filed Nov. 2, 1979, Ser. No. 90,655
Int. Cl.³ E05C *17/56*
U.S. Cl. 292—251.5 **6 Claims**

1. A magnetic latch and detector switch in combination comprising:

a magnetic latch means, said latch means including:

a permanent magnet having a bore therethrough; and

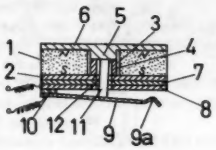
a ferromagnetic latch plate having a projection which extends into said bore when said latch is in a first position whereby it is magnetically attached to one end of said magnet; and

a detector switch means, said switch means including:

an insulation plate having one side connected to the other end of said magnet and having a hole therethrough which corresponds to said bore;

a contact element fixed to said insulation plate at a side opposite said magnet and having an aperture therethrough which corresponds to said hole;

a movable contacting piece;



a resilient insulator positioned between and respectively connected to said element and said piece such that one end of said piece is biased inward and toward said contact element; and

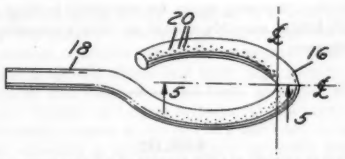
said piece having a dielectric pin inwardly extending from said piece and projecting through said aperture and hole and into said bore, said piece being of a length whereby when said latch plate is in said first position said pin abuts said latch plate projection and forces said piece outward and away from said contact element and when said latch plate is unattached to said magnet said piece is biased inward and into contact with said contact element.

4,310,189

GOLF BALL RETRIEVER

Joseph A. Nihra, 139 W. Robert St., Hazel Park, Mich. 48030

Filed Jan. 21, 1980, Ser. No. 113,555
Int. Cl.³ G66F *11/00*
U.S. Cl. 294—19 A **4 Claims**

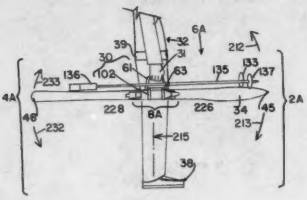


1. A golf ball retriever comprising a handle, a stem fixedly secured at one end thereof to an end of said handle, a loop formed on the other end of said stem with the ends thereof spaced apart, and a plurality of embossments formed around the inner peripheral surface of said loop along the centerline thereof, the centerline of said plurality of embossments spiralling from being principally on one side of the centerline of said inner peripheral surface of said loop to being principally on the other side of said centerline of said inner peripheral surface, thereby enhancing the gripping characteristics thereof when either side of the loop, at random, is brought into contact with a golf ball.

4,310,190
SKI AND SKI POLE CARRYING APPARATUS

Jerome H. Schuetzeberg, 5703 -37th St., Lubbock, Tex. 79416, and Roy L. Schuetzeberg, 3207 - 67th St., Lubbock, Tex. 79413

PCT No. PCT/US80/00327, § 371 Date Mar. 6, 1980, § 102(e) Date Mar. 6, 1980, PCT Pub. No. WO81/02525, PCT Pub. Date Sep. 17, 1981
PCT Filed Mar. 6, 1980, Ser. No. 214,060
Int. Cl.[3] A63C *11/02*
U.S. Cl. 294—147 10 Claims



7. A ski and ski pole carrying assembly comprising a ski holder assembly and a ski pole holder assembly,

the ski holder assembly comprising a ski holder assembly frame and a resilient band,

said ski holder assembly frame comprising a rigid horizontally extending base, a rigid vertically extending front bar and a rigid vertically extending rear bar firmly joined together and outlining a ski holder assembly frame enclosure, said band attached to said base,

said ski holder assembly base comprising a releasable band attachment supported on said base and said resilient band attached at one end to said base and at its other end releasably attached to said releasable band attachment,

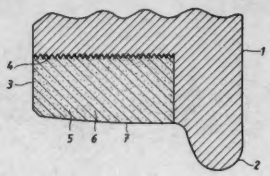
said ski pole holder assembly comprising laterally extending left and right ski pole holder units, a support holder unit, and a core, said ski pole holder units each comprising curved arms at top and bottom of the ski pole holder units, and attached to and extending from said core on opposite sides thereof, said arms comprising internally concave sectors of a cylinder and defining a cylindrical ski pole holder unit enclosure therebetween, the said support holder unit comprising vertically and longitudinally extending rigid side plates attached at said core and parallel to each other and transversely extending ledges, said core and said rigid plates and said ledges defining a support holding enclosure, and said ski and ski pole carrying assembly comprising means for releasably holding said ski pole holder assembly in said ski holder assembly frame enclosure.

4,310,191
WHEELS HAVING HARD PARTICLES DISTRIBUTED IN METALLIC TREAD

Henry Halldin, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Jan. 8, 1979, Ser. No. 1,748
Claims priority, application Sweden, Jan. 10, 1978, 7800227
Int. Cl.[3] B60B *17/00*
U.S. Cl. 295—31 R 13 Claims

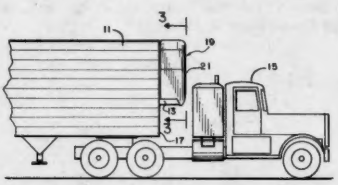
1. In a railbound vehicle which includes wheels for movably supporting the vehicle on rails, each of said wheels including a center portion, a guiding flange at one end thereof and a tread, the improvement wherein said tread is formed as the outermost surface of a conical wear layer positioned around said center portion of said wheel, said wear layer being formed of a metallic compound in which are evenly distributed hard friction-increasing particles of a material selected from the group consisting of carbide grains, oxide grains, nitride grains and boride grains having a size of greater than 5 microns.



4,310,192
AERODYNAMIC WIND DEFLECTOR FOR A REFRIGERATED TRAILER

Joseph M. Fitzgerald, 8690 Los Coyotes Dr., Buena Park, Calif. 90621

Filed Aug. 7, 1980, Ser. No. 176,249
Int. Cl.[3] B62D *35/00*
U.S. Cl. 296—1 S 20 Claims



1. An apparatus for reducing the aerodynamic drag of a refrigerated cargo carrying vehicle of the type having a front wall and a refrigeration unit on said front wall, said apparatus comprising:

a wind deflector for at least partially enclosing the refrigeration unit and configured to reduce the aerodynamic drag of the vehicle; and

means for attaching the wind deflector to the refrigeration unit for movement between a drag reducing position in which the wind deflector at least partially encloses the refrigeration unit to reduce the aerodynamic drag of the vehicle when the vehicle is moving forward whereby access to the refrigeration unit is limited and an access position in which the wind deflector is displaced from the drag-reducing position to provide increased access to the refrigeration unit.

4,310,193
ADJUSTABLE FOOTREST FOR VEHICLES

Pete D. Kolleas, 10855 SW. Park St., Tigard, Oreg. 97223

Filed Jan. 24, 1980, Ser. No. 114,307
Int. Cl.[3] B60N *3/06*
U.S. Cl. 296—75 12 Claims

1. An adjustable footrest for installation on an interior side panel in a vehicle's driver compartment, comprising:

a narrow elongated plate-like footrest mounting bracket member having opposite upper and lower ends for attachment to said side panel,

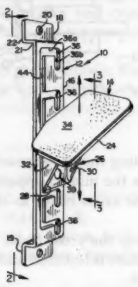
a footrest member for attachment to said mounting bracket member,

cooperative keeper means on said bracket member and said footrest member for retaining said footrest member on said bracket member, said keeper means on said bracket member including at least three regularly spaced apart keeper slots, said keeper means on said footrest member

including at least two keeper studs having enlarged head portions for selective cooperative interengagement with said keeper slots on said footrest mounting bracket member, said keeper slots and keeper studs being arranged generally vertically when interconnected and said bracket member is attached to said side panel,

adjustment means associated with said keeper slots to enable movement of said footrest member generally vertically relative to said bracket member and selective interengagement of said keeper studs on said footrest member with some of said keeper slots on said bracket member,

said footrest member comprising a footrest plate and a footrest plate support connected to and depending from a side edge of said footrest plate, said support including a hanger



wall portion in a plane generally normal to the plane of said footrest plate and gusset means extending from said hanger wall portion beneath said footrest plate to partially support said footrest plate, said hanger wall portion mounting said keeper studs,

said footrest plate extending in an inclined plane when said footrest member is attached to said bracket member and with said bracket member and said hanger wall portion lying in generally vertical planes,

attachment means at said opposite upper and lower ends of said bracket member for attaching said bracket member to said interior side panel, and

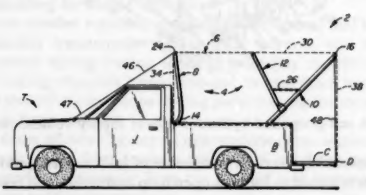
spacer means at said opposite ends of said bracket member for spacing said bracket member from said interior side panel when said bracket member is attached thereto.

4,310,194

TENT CAMPER FOR PICKUP TRUCK

Joseph A. Biller, 810 Lexington, El Cerrito, Calif. 94530

Filed Aug. 25, 1980, Ser. No. 180,736
Int. Cl.³ B60P *3/32*
U.S. Cl. 296—159 **10 Claims**



1. A tent camper for mounting to the cargo compartment of a pickup truck, the cargo compartment having a generally rectangular floor, first and second generally parallel sidewalls, a front wall adjacent the cab of the pickup, and a rear tailgate opposite the front wall, said tailgate operable to a vertical, raised position and a horizontal, lowered position, said tent camper comprising:

a generally U-shaped fore support having a first central portion and a first pair of spaced apart free ends, said fore support pivotally attached at said first free ends to the cargo compartment near the cab;

a generally U-shaped aft support having a second central portion and a second pair of free ends, said aft support pivotally attached at said second free ends to the cargo compartment near the tailgate;

a cloth cover having a top and first, second, third and fourth sides depending from said top, said top shaped to generally overlie the floor and the tailgate when the tailgate is in the horizontal, lowered position, said sides sized to extend between said top and the first, second and front sidewalls and the lowered tailgate respectively when said first and second central positions are generally above said front sidewall and the upper edge of the lowered tailgate respectively and said top is supported thereby;

fore strap means for pivotally urging said fore support toward the cab;

aft strap means for pivotally biasing said aft support away from said cab so that said cover is stretched between said fore and aft supports;

means for removably fastening said first and second sides to the said first and second sidewalls respectively; and

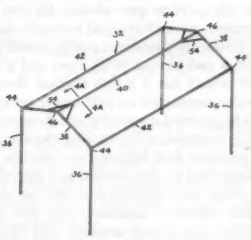
said fourth side of said cover including door means for entrance within the cargo compartment covered by said cover.

4,310,195

CAMPING TRAILER HAVING A FOLD OUT BODY AND INCLUDING A FRAME SUPPORTING A TENT

Arlen L. Huff, South Bend, Ind., assignor to Robert A. Monnig, Glasgow, Mo.

Filed Jan. 2, 1979, Ser. No. 442
Int. Cl.³ B60P *3/34*
U.S. Cl. 296—173 **5 Claims**



1. A trailer including a body supported by wheels, said body having a four sided peripheral edge portion defined by four corner sections, a storable tubular frame carried by said body, said frame projecting above said body edge portion, a tent supported by said frame over said body, an improvement in said trailer wherein said frame includes (a) four corner posts each releasably secured at one end to a said body corner section and extending generally vertically upwardly therefrom and terminating in a bent portion, two inverted V-shaped parts each having a center apex, each V-shaped part releasably interfitted at each of its ends to the bent portion of a said corner post to form a continuous frame section from one body corner section to another body corner section, a center longitudinal part overlying said body and having each end in abutment with a V-shaped part at its apex, first and second side longitudinal parts extending along opposite sides of said body and paralleling said center longitudinal part, said side longitudinal parts having each end in abutment with a corner post at its bent portion, whereby said center and side longitudinal parts form an overhead support for said tent, and (b) a releasable elongated shape retaining expandable member extended in tension between said center longitudinal part and each V-shaped part

adjacent its apex to secure the corner posts and attached V-shaped part and longitudinal parts together as an integral unit for supporting said tent, said V-shaped and longitudinal parts being disconnectable for storage purposes upon release of each expandable member, said tent supported in an expanded position by said corner posts and V-shaped and longitudinal parts of said frame when secured together by each expandable member.

4,310,196

VEHICLE PASSENGER SEAT

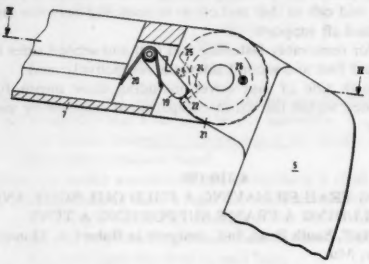
Ignaz Vogel, Kleinsteinbacher Str., 42-44 Karlsruhe 41-Stu, Fed. Rep. of Germany (7500)

Filed Feb. 25, 1980, Ser. No. 124,432

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1979, 2907463

Int. Cl.³ A47C 7/54

U.S. Cl. 297—417 **3 Claims**



1. Vehicle passenger seat comprising: a seating member; a backrest member associated with said seating member; and an armrest associated with seating member, said seating member including a side portion provided at its rear end with an upstanding armrest carrier having at its upper end a crank portion projecting forwardly a distance corresponding to the thickness of said armrest and having at its front end a circular sectional disc portion which has a notch formed therein, said armrest being pivotally supported on said crank portion such that said armrest can be pivoted upwardly and downwardly and enclosing a latching mechanism for locking the armrest in a predetermined use position, said latching mechanism including a pawl pivotally supported in said armrest and biased to be received in said notch when said armrest is in the use position, a narrow blocking disc mounted adjacent said disc portion rotatably about the pivot axis of said armrest, said blocking disc having a notch at least corresponding to the notch of said disc portion and said armrest being provided with a keeper pin extending into the notch of said blocking disc so as to cause rotation of said blocking disc when one of the edges forming said notch is engaged by said keeper pin, said pawl having a width at least equal the combined thickness of said disc portion and said blocking disc, said latch mechanism including means for controlling the position of said blocking disc, said blocking disc preventing said pawl from entering the notch of said disc portion when it is prevented by the blocking disc upon upward pivoting of said armrest thereby causing said pawl to ride over the notch in said disc portion for downward pivoting of said armrest.

4,310,197

MINING AND BOLTING METHOD AND APPARATUS

William E. McCracken, Pittsburgh, Pa., and Gary A. Hakes, Hopewell, N.J., assignors to Lee-Norse Company, Pittsburgh, Pa.

Filed May 1, 1980, Ser. No. 145,686

Int. Cl.³ E21D 17/10, 21/00

U.S. Cl. 299—11 **16 Claims**

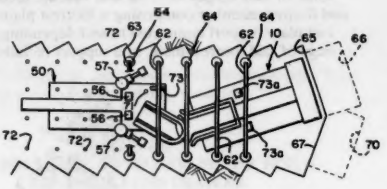
1. A method of mining, wherein a mining apparatus and a bolting apparatus in a mine entry is positioned near a mine face and under a temporary roof support comprised of cross beams supported by beam jacks, that comprises:

a. dislodging material from the mine face with a mining apparatus wherein the mine face is advanced;

b. transporting dislodged material from the mine face;

c. installing roof bolts above the bolting apparatus to provide permanent roof support;

d. removing a cross beam support with a lowering means on the bolting apparatus;



e. transporting the cross beam by manual means to a lifting means on the mining apparatus;

f. lifting the cross beam to the mine roof with the lifting means;

g. supporting the cross beam with beam jacks wherein the lifting means is lowered and the temporary roof support is advanced;

h. advancing the mining apparatus and the bolting apparatus towards the advanced mine face; and

i. repeating steps a, b, c, d, e, f, g and h.

4,310,198

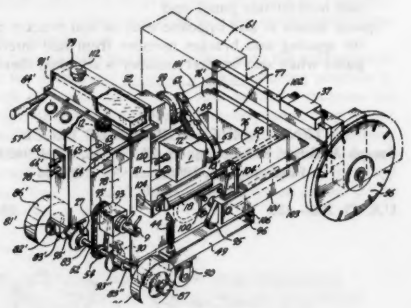
HYDRAULIC POWER SUPPLY VEHICLE FOR CONCRETE CUTTING AND BORING TOOLS

Allen Destree, 5218 92nd SW., Everett, Wash. 98204

Filed Mar. 24, 1980, Ser. No. 133,612

Int. Cl.³ E21C 47/00

U.S. Cl. 299—39 **7 Claims**



1. A self-propelled hydraulic power supply vehicle comprising:

a hydraulic reservoir and frame of hollow structural members joined to form an open loop hydraulic fluid reservoir, said reservoir having exterior surfaces thereon exposed to dissipate heat from the hydraulic fluid contained therein to the atmosphere, said reservoir and frame providing a structural frame for the entire vehicle;

rear driving wheels for supporting said vehicle on a support surface;

a prime mover fixedly attached to and supported by said reservoir and frame;

at least one hydraulic pump driven by said prime mover;

hydraulically actuated tool mounting assembly pivotally attached to said reservoir and frame for movement of a tool from a first operating position to a second operating position relative to a support surface;

driving and steering means operatively engaged with said wheels for driving and steering said vehicle;

a castor arm pivotally mounted on said reservoir and frame;

castor wheels fixedly mounted on said castor arms adjacent to said rear driving wheels and adapted to pivot from a first position into a support surface engaging position whereby said rear driving wheels are disengaged from said surface;

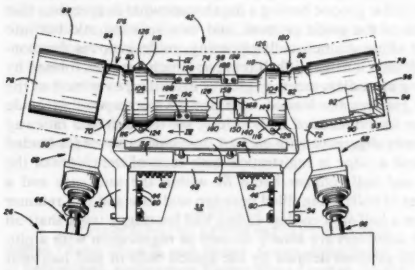
a cam fixedly mounted on said tool mounting assembly for engagement with said castor arm whereby raising said tool mounting assembly to a specified height engages said cam with said castor arm forcing said castor arms and attached castor wheels to engage a support surface and lift said vehicle;

said reservoir and frame and the hydraulic fluid contained therein with said driving and steering means thereon providing a stable yet portable hydraulic tool mounting platform.

4,310,199
CUTTER DRUM ASSEMBLY FOR A CONTINUOUS MINING MACHINE

Donald L. Freed, Jr., and Gerald L. Baum, both of Belleville, Ill., assignors to National Mine Service Company, Pittsburgh, Pa.

Filed Sep. 20, 1979, Ser. No. 77,328
Int. Cl.[3] E21C *27/24*
U.S. Cl. 299—76 15 Claims



1. A continuous mining machine comprising,

a body portion,

propelling means supporting said body portion for advancing said body portion,

a boom member pivotally secured to said body portion and extending forwardly therefrom,

a drum member rotatably mounted on the front of said boom member transversely to said body portion, said drum member having cutting elements extending therefrom,

said cutting elements being arranged on said drum member to provide a continuous cutting pattern along the length of said drum member,

said drum member having an intermediate drum section and a pair of end drum sections, said pair of end drum sections extending outwardly from the ends of said intermediate drum section respectively,

drive means extending from said body portion for rotating said drum member, said drive means being nonrotatably connected to said pair of end drum sections,

intermediate drum drive means extending from said drive means into said intermediate drum section for rotating said intermediate drum section,

said intermediate drum drive means including a pair of intermediate drive shafts each having a first end portion drivingly connected to said pair of end drum sections respectively,

said pair of intermediate drive shafts extending from said pair of end drum sections respectively into opposite ends of said intermediate drum section,

said pair of intermediate drive shafts each having a second end portion positioned within said intermediate drum section,

said intermediate drive shaft second end portions each having a plurality of planar surfaces positioned around the periphery of each intermediate drive shaft,

drum connecting means being nonrotatably secured to said planar surfaces of said second end portions for transmitting rotation from said intermediate drive shafts to said intermediate drum section,

means for rotatably supporting said intermediate drum drive means axially in said intermediate drum section,

said intermediate drum section including a pair of housing sections positioned in surrounding relation with said intermediate drum drive means,

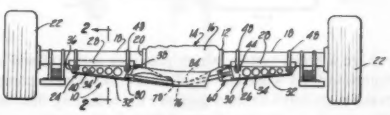
means for releasably joining together said pair of housing sections in assembled relation around said intermediate drum drive means, and

said drum connecting means being releasably positioned on said planar surfaces of said intermediate drive shaft second end portions.

4,310,200
DRIVE AXLE TRUSS ASSEMBLY

James P. Olender, 1348 Hart Lake Dr., Gaylord, Mich. 49735

Filed Dec. 18, 1979, Ser. No. 104,873
Int. Cl.[3] B60B *35/16*
U.S. Cl. 301—129 6 Claims



1. A truss assembly for a drive axle of a vehicle, said drive axle having a lower side which faces a ground surface, said drive axle having a differential and a pair of axle housings extending laterally outwardly from opposite sides of the differential and a suspension spring attached to each axle housing, said truss assembly comprising:

a first elongated truss member, said first truss member comprising a first elongated channel member having a surface which substantially conforms to and abuts against the lower surface of one axle housing along substantially the entire length of said one axle housing between the differential and its suspension spring, a first elongated reinforcing rib longitudinally secured to said first channel member so that said rib depends downwardly toward the ground surface,

means for securing said first truss member to said one axle housing comprising at least two longitudinally spaced clamps disposed around said one axle housing and secured to said first truss member,

a second elongated truss member, said second truss member comprising a second elongated channel member having a surface which substantially conforms to and abuts against the lower surface of the other axle housing along substantially the entire length of said other axle housing between the differential and its suspension spring, a second elongated reinforcing rib longitudinally secured to said second channel member so that said rib depends downwardly toward the ground surface,

means for securing said second truss member to said one axle housing comprising at least two longitudinally spaced

clamps disposed around the other axle housing and secured to said second truss member,

an elongated bar fixedly secured at one end to the end of the first truss member adjacent the differential and extending underneath said differential toward said second truss member, said bar being positioned so that a midpoint of the bar abuts along the bottom of the differential, and

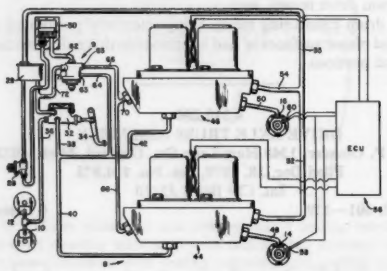
means for longitudinally adjustably securing the other end of the bar to the end of the second truss member adjacent the differential whereby the tension on said bar can be varied.

4,310,201

ADAPTIVE TRACTION PRESSURE REGULATOR

Edward M. Pauwels, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 7, 1979, Ser. No. 101,301
Int. Cl.³ B60T *8/02*
U.S. Cl. 303—110 **6 Claims**



1. In a brake system which provides anti-skid and anti-spin functions for a wheeled vehicle, the brake system comprising a brake responsive to fluid pressure for retarding the rotation of the wheel, a source of controlled fluid pressure generated during an operator brake application and normally communicated to the brake during the operator brake application, a source of stored fluid pressure, a modulator valve for controlling communication of fluid pressure between the sources and the brake, and control means for sensing a potential wheel skid condition, the control means cooperating with the modulator valve during anti-skid operation to close communication between the controlled pressure source and the brake upon occurrence of the potential skid condition to substantially reduce the fluid pressure communicated to the brake to eliminate the potential skid condition whereupon the control means cooperates with the modulator valve to open communication between the stored pressure source and the brake when the potential skid condition is eliminated, the control means also sensing a potential wheel spin condition and cooperating with the modulator valve during anti-spin operation to open communication between the stored pressure source and the brake to increase the fluid pressure communicated to the brake to eliminate the potential wheel spin condition, the improvement comprising:

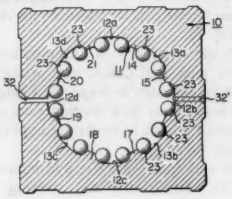
a regulator communicated with the stored pressure source, with the controlled pressure source and with the modulator valve, the regulator comprising means for regulating the fluid pressure communicated to the brake when the potential skid condition is eliminated so that the brake fluid pressure is substantially equal to the fluid pressure generated by the controlled source during an operator brake application, the regulator also comprising means for regulating the brake fluid pressure at a predetermined pressure less than the stored fluid pressure during anti-spin operation of the brake system.

4,310,202

LINEAR BALL BEARING UNIT AND METHOD FOR MANUFACTURING SAME

Hiroshi Teramachi, 2-34-8 Higashi-Tamagawa Setagaya-ku, Tokyo, Japan (158)

Filed Apr. 4, 1980, Ser. No. 137,489
Claims priority, application Japan, Apr. 28, 1979, 54-53245
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **6 Claims**



1. A linear ball bearing unit comprising a halfsplit bearing case having a semicircular inner wall in transverse cross-sections said case having been formed by forming a cylindrical inner wall centrally and longitudinally through an elongated square bar, forming in the inner surface of the cylindrical inner wall alternately and axially a plurality of guide grooves for loaded balls and guide grooves for non-loaded balls, said grooves having a U-shaped groove wall in transverse cross-section, forming a circular groove, for changing the rolling direction of balls, at each end portion of each of the grooves for loaded balls and its corresponding groove for non-loaded balls to define a ridge between each of the said grooves for loaded balls and its corresponding groove for non-loaded balls, said circular groove having a depth somewhat deeper than that of each of the guide grooves, and then splitting said bar into halves along diametrically-opposing guide grooves for non-loaded balls; a half-split ball retainer which has been formed by forming an endless raceway groove extending over each of the guide grooves for loaded balls and its corresponding guide groove for non-loaded balls, a long slit through said raceway groove in alignment with each of the guide grooves for loaded balls and a ridge in registration with each of the ridges of the case, said ball retainer being fit within the said case and a number of balls being filled between said case and ball retainer to form a half-split endless sliding ball bearing; a track shaft on which shoulders are axially formed in registration with a plurality of grooves defined by the loaded balls of said half-split endless sliding ball bearing, said track shaft being assembled with said half-split endless sliding ball bearing in such a manner that the line connecting a first point of contact between a loaded balls and said track shaft and a second point of contact between the same loaded ball and said case meets at a first acute angle with a line extending between said diametrically-opposing guide grooves for non-loaded balls as well as the line connecting a third point of contact between another loaded ball and said track shaft and a fourth point of contact between the same loaded ball and said case meets at a second acute angle with a line extending perpendicularly to the former line and passing through the center of the inner wall of the case.

4,310,203

HYDROSTATIC SUPPORT ASSEMBLY

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Division of Ser. No. 954,555, Oct. 25, 1978. This application Feb. 20, 1980, Ser. No. 122,926
Int. Cl.³ F16C *32/06*
U.S. Cl. 308—9 **24 Claims**

1. An assembly including

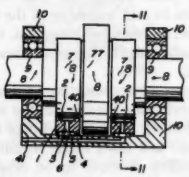
an element, which is capable to carry a load, borne for centred rotation in a pair of endwards located setting bearings which are fastened to a body,

wherein at least one limitedly moveable support member is provided relatively to the axis of the said element on said element in the direction of said load which said element carries,

wherein said support member has a bearing face complementary to a respective outer face of said element and facing said outer face of said element,

wherein said bearing face is interrupted by a hydrostatic fluid pressure pocket extending through said bearing face into said support member and forming with said bearing face a hydrostatic bearing, wherein portions of said bearing face are forming the sealing land of said fluid pressure pocket,

wherein said support member is subjected to the thrust in fluid in a pressure chamber which is located between said



body and said support member and said support member mounted radially moveable in a limited extent on a portion of said body in a direction contrary to said direction of said load; wherein a source of fluid under pressure is provided and communicated to said pressure chamber and to said pocket to provide fluid and a pressure therein to said pocket to provide to said pocket a capability to carry a load by said pressure; and,

wherein a passage is provided from said source to said fluid pressure pocket to carry said pressure and said fluid from said source to said pressure chamber and to said pocket, whereby said support member is pressed by said thrust in said pressure chamber against said element in said direction contrary to said direction of said load into sealing engagement of said bearing face of said support member on said outer face of said element.

4,310,204

HYDROSTATIC SUPPORT APPARATUS

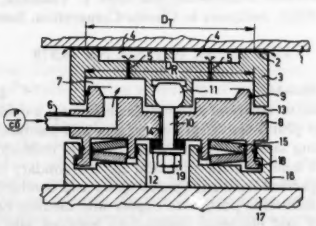
Alfred Christ, Zurich, and Heinz Annen, Hägglingen, both of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Feb. 20, 1980, Ser. No. 123,043

Claims priority, application Switzerland, Feb. 26, 1979, 1856/79

Int. Cl.³ F16C *32/06, 17/06*

U.S. Cl. 308—9 **8 Claims**



1. Hydrostatic support apparatus for supporting a movable machine part on a stationary machine base comprising a support member mounted for movement relatively to the base in the supporting direction; a bearing plate mounted for movement relatively to the support member in the supporting direction and defining therewith a pressure chamber, the bearing plate being urged toward the machine part by the pressure in that chamber; supply means for delivering pressure fluid to the chamber; a bearing surface on a side of the bearing plate facing the machine part and containing at least one bearing pocket; a choke bore connecting the bearing pocket with the pressure chamber; biasing means urging the support member toward the machine part; spring means urging the support member and the bearing plate toward each other; and stop means limiting the motions of the support member and the bearing plate in the supporting direction so that the range of motion between the plate and member is greater than the range of motion between the member and base, whereby the spring means is effective to retract the bearing plate from the machine part upon a loss of pressure in the chamber.

4,310,205

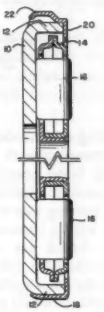
THRUST WASHER RETAINING BAND

Charles E. Condon, Jr., Harwinton; Dean E. Johnston, Thomaston, and Charles W. Shattuck, Goshen, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Mar. 10, 1980, Ser. No. 128,855

Int. Cl.³ F16C *19/00, 35/06*

U.S. Cl. 308—135 **3 Claims**



1. A thrust bearing comprising: a thrust bearing washer having a radially-extending portion and an axial annular flange; a plurality of rollers adapted to roll along said radially-extending portion of the thrust bearing washer and a separate annular band having an axially-extending annular portion having a periphery engaging a periphery of the thrust washer flange, said band having at least one protrusion adapted to provide an interference fit between the annular band and the device on which the thrust washer is mounted.

4,310,206

UNIVERSAL JOINT WITH LUBRICATING MEANS

Warren W. Weible, Defiance, Ohio, assignor to The Zeller Corporation, Defiance, Ohio

Continuation of Ser. No. 27,243, Apr. 5, 1979, abandoned. This application Sep. 24, 1980, Ser. No. 190,427

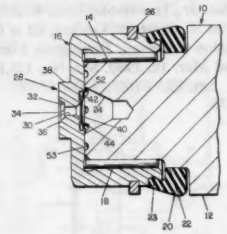
Int. Cl.³ F16C *33/66;* F16D *3/26*

U.S. Cl. 308—187 **8 Claims**

1. A cross and bearing cup combination for a universal joint, said cross having a trunnion, said bearing cup being positioned around said trunnion and having a central opening extending therethrough, said cup having a recess at the outer surface thereof concentric with said opening and being contoured to receive and closely fit with a nozzle of a lubricating tool, said bearing cup having a central, short cylindrical projection on the outer surface in which said recess is located, and a valve carried by said cup at the inner surface around said opening and having a portion aligned with said opening, said portion being effective to move away from the inner surface when lubricant under pressure is supplied through said opening from

the outer surface to enable lubricant to enter the cup through said opening.

5. A cross and bearing cup combination for a universal joint, said cross having a trunnion with a solid cross section at its base, said bearing cup being positioned around said trunnion and having a central opening extending therethrough, an outer, structurally integral, central portion of said cup at said opening having an outer surface which is contoured to receive and closely fit with a nozzle of a lubricating tool, said cup having a shallow recess on the inner surface thereof concentric with said opening, and a valve located in said recess and having a valve portion aligned with said opening, edges of said valve being engaged by staked portions of a peripheral wall of the recess, said valve portion being effective to move away from the inner surface when lubricant under pressure is supplied through said opening from the outer surface to enable lubricant to enter the cup through said opening.



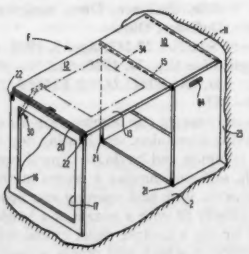
6. A cross and bearing cup combination for a universal joint, said cross having a trunnion with a solid cross section at its base, said bearing cup being positioned around said trunnion and having a central passage extending therethrough, with the outer surface of said bearing cup at the outer end of said passage having a recess with a truncated conical surface and an outer flared surface which are contoured to receive and closely fit with a nozzle of a lubricating tool, and a valve carried by said cup at the inner surface around said passage and having a portion aligned with said passage, said passage having an outwardly flaring surfce at its inner end communicating with said portion whereby said portion moves away from the inner surface when lubricant under pressure is supplied through said passage from the outer surface to enable lubricant to enter the cup through said passage.

4,310,207

MULTI-PURPOSE FURNITURE

John Adams, Jr., 1027 Valley Forge Rd., Devon, Pa. 19333

Filed Nov. 23, 1979, Ser. No. 96,794
Int. Cl.[3] A47B *43/00, 5/00*
U.S. Cl. 312—314 **6 Claims**



1. A multi-purpose furniture item for use in a building structure having a floor comprising:

support means to stand upright on said floor and having vertically extending front and rear sections and a horizontally extending top section extending between the front and rear sections, the support means including interior mechanism to support articles to be stored, each said section being flat and rectangular in shape;

an intermediate panel, the intermediate panel being flat, rectangular in shape and having substantially the same area as the area of said top section;

first hinge means connecting the intermediate panel to the support means at the intersection of the top and rear sections;

a work panel, the work panel being flat, rectangular in shape and having substantially the same area as the area of said front section and having top and bottom surfaces;

second hinge means connecting the work panel with the intermediate panel along the edge of the intermediate panel opposite to said one edge of the intermediate panel;

a utility member, the member being flat, rectangular in shape and having substantially the same area as the area of said front section;

third hinge means interconnecting said utility member with said work panel along the edge of the work panel opposite to the edge having said second hinge means;

said first, second and third hinge means providing for the panels and utility member to be oriented for a storage condition, a display condition and a utility condition;

(a) in the storage condition, the intermediate panel engaging said top section, the utility member being folded back on and engaging the bottom surface of said work panel and also engaging said front section;

(b) in the display condition, the intermediate panel extending vertical upwardly from said top section, the work panel extending vertically upwardly from the first panel and co-planar therewith and the utility member being folded back on and engaging the bottom surface of said work panel;

(c) in the utility condition, the intermediate panel engaging said top section, the work panel extending horizontally outwardly generally co-planar with the intermediate panel and the utility member extending vertically downwardly from the work panel in engagement with said floor and cooperating with said second hinge means to support the work panel in said horizontal position;

means operative in said utility condition to releasably maintain said work panel and said utility member in said angular orientation;

means operative in said display condition to maintain the intermediate and the work panels in said vertical orientation.

4,310,208

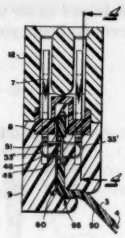
MOLDED ELECTRICAL CONNECTOR

John L. Webster, Painesville, and John T. Venaleck, Mentor, both of Ohio, assignors to Chabin Corporation, Santa Clara, Calif.

Filed Sep. 13, 1979, Ser. No. 74,978
Int. Cl.[3] H01R *9/07*
U.S. Cl. 339—14 R **25 Claims**

1. A cable termination assembly, comprising: a cable including at least plural electrical conductors and insulation means for insulating said electrical conductors, said insulation means including a main insulation portion and a secondary insulation portion separated from and spaced along said conductors from said main insulation portion to expose intermediate conductor portions of said electrical conductors between said adjacent insulation portions, each of said electrical conductors having portions in and supported by both said main and secondary insulation portions, contact means for electrically connecting at least one of said electrical conductors to an external device, said contact means including means for electrically connecting the same with said exposed intermediate conductor portion of said at least one electrical conductor to form a contained in

both insulation portions for support thereby, contact means for electrically connecting at least some of said electrical conductors to an external device, said contact means including means for electrically connecting the same with respective exposed intermediate conductor portions to form respective junctions therewith, body means for enclosing said junctions and said intermediate conductor portions and securing the same in



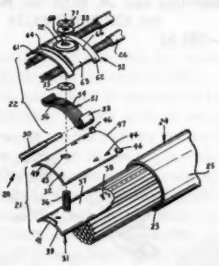
relative position while leaving part of said contact means exposed for electrically connecting with such external device, at least a plurality of said electrical conductors extending through said secondary insulation portion and having exposed ends for exposure beyond the end of said secondary insulation portion remote from said main insulation portion, and means for electrically connecting said plurality of electrical conductors in common at the exposed ends thereof.

4,310,209

CABLE SHIELD CONNECTING DEVICE

Mills L. Fleming, Lawrenceville; George L. Fuchs, Gainesville; Robert H. Gladden, Jr., Norcross, and Robert R. Ross, Gainesville, all of Ga., assignors to Western Electric Company, Inc., New York, N.Y. and Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Feb. 25, 1980, Ser. No. 124,501
Int. Cl.³ H01R *4/66*
U.S. Cl. 339—14 R **10 Claims**



1. A device for providing an electrical connection to a metallic shield of a cable, having a plurality of conductors enclosed by the shield an an overlying protective jacket, and for providing an electrical connection to at least one conductive member external to the cable, said device comprising:

a first clamp which comprises an inner metallic plate having a metallic post upstanding therefrom and an outer plate having an opening therein for receiving said post for establishing an electrical connection with a metallic shield of a cable, said first clamp adapted to be attached to the cable with said inner plate engaging the shield and said outer plate engaging an outwardly facing surface of the cable jacket to interpose a portion of the shield and of the overlying jacket between said inner and said outer plates;

a second clamp which is adapted to be secured to said first clamp in engagement with said outer plate and which includes means for holding at least one conductive member external to the cable in a clamped tortuous configuration and for controlling the clamped configuration through longitudinal and end sections of each said conductive member to prevent inadvertent movement of each said conductive member while preventing undue compression thereof, said second clamp including a bonding plate having an aperture therein, said bonding plate adapted to be seated in engagement with said outer plate of said first clamp with said post extending through the aperture of said bonding plate, and an outer clamp which is adapted to be secured to said bonding plate; and

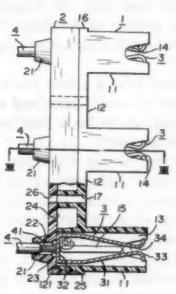
fastening means for attaching said first clamp to the cable with a portion of a shield and overlying jacket clamped between said inner and outer plates thereof and for securing said second clamp to said first clamp to hold said at least one conductive member in said clamped configuration, said fastening means being effective to control the securing of said second clamp to said first clamp without undue compression of each said conductive member.

4,310,210

PLUG-IN TYPE CONNECTOR

Masaru Takahashi, and Kiyoshi Sato, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 845,936, Oct. 27, 1977, abandoned.
This application Aug. 28, 1979, Ser. No. 70,634
Claims priority, application Japan, Oct. 28, 1976, 51/145176
Int. Cl.³ H01R *13/115, 13/436*
U.S. Cl. 339—64 M **9 Claims**



1. A plug-in type connector comprising:

an insulating case having a hollow chamber for containing a contact element, said chamber having a base, walls extending from the base, and an open top surface;

a U-shape contact element having inwardly inclined legs located within said chamber in a floating condition, said U-shape contact element comprising a base located adjacent said base of said chamber and said legs extending from the base of said element and having ends located adjacent and below said open top surface of said chamber, said contact element being smaller than said chamber so as to be movable within said chamber due to the resulting space between said U-shape element and said walls of said chamber; and

at least one elongated project formed on an inner wall of said chamber, said project having one end facing the base of the chamber with a gap which is slightly greater than the thickness of said base of said U-shape contact element and an other end positioned between said inwardly inclined legs of the U-shape contact element;

whereby the contacting of one of said legs by said at least one elongated project limits the movement of said leg; and

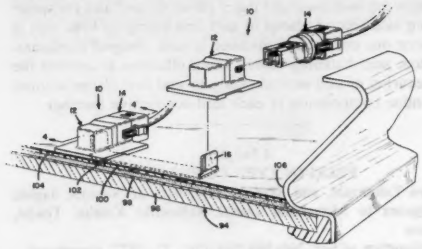
wherein when a bus bar is not inserted in said contact element, there are small clearances between said other end of

said project and each of said U-shape contact legs whereas when said bus bar is inserted, relatively large clearances are produced therebetween.

4,310,211
HIGH CURRENT CONTACT SYSTEM FOR SOLAR MODULES

Edward D. Bunnell, Palm Harbor, and Thomas J. Sotolongo, Clearwater Beach, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 26, 1979, Ser. No. 106,813
Int. Cl.³ H01R *13/627*
U.S. Cl. 339—91 R **9 Claims**



1. An improved electrical connector for photovoltaic solar panels and the like, said connector comprising:

a receptacle member having an elongated body and an integral planar pad with the longitudinal axis of the body extending parallel to the plane of the pad, a profiled bore in said body and a slot extending between said pad and said bore;

a first terminal having a base portion adapted to be secured to a bus bar of a solar panel and a blade adapted to extend through said slot to lie, at least in part, in said bore of said receptacle member;

a plug member having a profiled body adapted to be received within said bore of said receptacle member, a profiled axial bore in said plug member having an enlarged, rearwardly directed cavity, a pair of spaced terminal enclosing arms extending forwardly of said profiled body and defining an extension of said axial bore, profiled annular sealing means mounted in said cavity and a cover member adapted to receive a rear portion of said plug member therein, means to secure said cover member on said plug member, means on said cover member to apply force to said sealing means to cause it to assume a sealing profile; and

a second terminal adapted to be mounted in said axial bore of said plug member, to mate with said first terminal and to terminate a conductor.

4,310,212
RETAINER MEMBER WITH DUAL ACTION CANTILEVER BEAMS

Sharanjit S. Aujla, Kanata, and John D. Lee, Manotick, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jul. 7, 1980, Ser. No. 166,619
Int. Cl.³ H01R *11/20*
U.S. Cl. 339—97 R **9 Claims**

1. A retaining member with dual action cantilever beams, comprising:

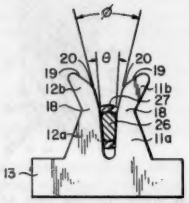
a base having an upper surface;

a pair of cantilever beams extending from the upper surface of the base and having opposed, spaced apart, substantially parallel inner edges, each beam having upper and lower portions and an entrance portion said edges defining a parallel sided open-ended slot extending from the upper surface;

each lower portion defined by an outer edge tapered upward and inward from said upper surface of said base and by a lower part of said inner edge;

each upper portion defined by an outer edge tapered upward and outward from said lower portion and by an upper part of said inner edge;

a neck in each beam defined by the conjunction of said outer edges of said upper and lower portions and by said inner edge;



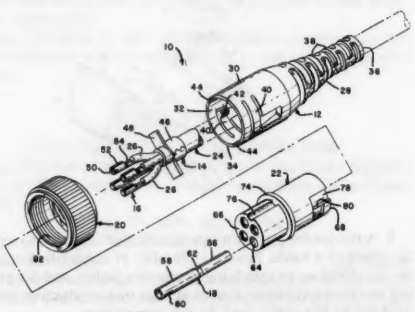
said entrance portion defined by upper edges of said beams, said upper edges inclined upwardly and outwardly from said inner edges, said upper edges and said inner edges joined by radii;

said necks defining pivotting position, said upper portions permanently deforming relative to said lower portions at said necks when a cylindrical member is initially inserted and said lower portions elastically deforming on further insertion of said cylindrical member.

4,310,213
ELECTRICAL CONNECTOR KIT

James R. Fetterolf, Sr., Burnsville, Minn.; Donald L. Metzger, Harrisburg, Pa.; Clair W. Snyder, Jr., Hellam, Pa., and James H. Wise, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 893,744, Apr. 5, 1978, abandoned. This application Jun. 28, 1979, Ser. No. 52,991
Int. Cl.³ H01R *13/58*
U.S. Cl. 339—103 M **11 Claims**



1. An electrical connector assembly for terminating a cable comprising a plurality of conductors encased within an outer cable sheath, said assembly comprising:

a like plurality of first terminals each having a rearward portion affixed to a forward end of one of said conductors, and a generally cylindrical forward portion having a longitudinal slot extending the length thereof dimensioned to receive a rearward portion of another said first terminal laterally therethrough;

a plurality of dual-ended second terminals each having a

hollow cylindrical rearward portion adapted to receive therein the forward portion at least one of said first terminals, and having integral forward mating means,

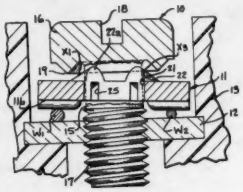
a housing member having a plurality of terminal receiving cavities extending therethrough from a forward end to a rearward end, each of said cavities being adapted to receive one of said second terminals therein and said housing member having integral retention means engaging said second terminals.

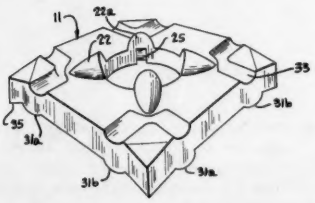
4,310,214

TILTABLE TERMINAL CLAMP ASSEMBLY

William R. Carlson, 221 Holidonhill Dr., Cincinnati, Ohio 45238

Filed Mar. 21, 1980, Ser. No. 132,400
Int. Cl.[3] H01R *4/44*
U.S. Cl. 339—246 8 Claims





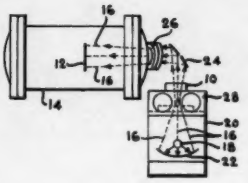
1. A tiltable terminal clamp assembly for removably securing at least one conductor to a terminal member comprising, a screw having a shank and a head at one end of the shank, the head having an underhead surface with an integral substantially circular protrusion spaced radially outwardly from the shank, a generally rectangular clamping plate having a generally flat central section and a generally circular aperture in the central section dimensioned to loosely and tiltably receive the shank of the screw adjacent the head, the shank having threads commencing at a location below the plate and extending toward the free end of the shank for threading into a terminal member, the plate having four angularly spaced raised embossments projecting above the upper surface of the central section and extending outwardly from the central aperture toward the four corners of the clamp plate a distance greater than the radial spacing of the circular protrusion from the shank for engagement with the circular protrusion on the head of the screw, the raised embossments having a maximum height and width adjacent the central aperture and decreasing in height and width in a direction outwardly of the aperture, the generally flat central section of the plate having four angularly spaced depressions in the undersurface thereof extending generally radially outwardly from the central aperture toward the four corners of the clamp plate each below a respective one of the angularly spaced raised embossments, the width of the depressions at the ends adjacent the aperture being small as compared to the angular spacing between adjacent ones of the depressions.

4,310,215

STABLE ULTRAVIOLET CHEMICAL FILTER

Lawrence R. Kelley, Redondo Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 14, 1980, Ser. No. 149,793
Int. Cl.[3] G02B *5/24*
U.S. Cl. 350—1.5 3 Claims



1. A stable, ultraviolet, liquid chemical filter for suppressing the heat producing light rays emanating from a simulated solar radiation source comprising:

a. A glass cylinder having ultraviolet transmitting fused silica windows positioned on each end of said cylinder and oppositely disposed from one another to form an enclosed chamber; and

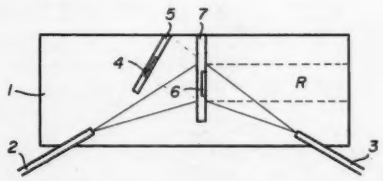
b. a liquid filtering medium positioned within said chamber between said oppositely disposed quartz windows and composed of distilled water, cobalt sulfate and hydrochloric acid.

4,310,216

PROCESS FOR MANUFACTURING A DEVICE FOR COUPLING AT LEAST TWO LIGHT CONDUCTORS AND A COUPLING DEVICE ACCORDING TO THIS PROCESS

Jean-Paul Pellaux, Neuchatel, Switzerland, assignor to Cabloptic S.A., Cortaillod, Switzerland

Filed Nov. 28, 1979, Ser. No. 98,250
Claims priority, application Switzerland, Dec. 1, 1978, 12298/78
Int. Cl.[3] G02B *5/32;* G03H *1/04*
U.S. Cl. 350—3.72 10 Claims

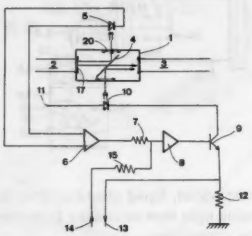


1. A process for manufacturing a device for coupling at least two light conductors by means of at least one coupling holographic lens, said process including the steps of: fixing the free ends of the said light conductors into a block of transparent synthetic polymeric resin having at least one slot disposed in the interference zone of beams emitted by the said ends of light conductors; introducing a sensitive substance, capable of recording a phase and volume hologram, into the said slot; illuminating the said substance by a first beam and a second beam of coherent light to form a grid of interference fringes and expose the said substance; recording and fixing said grid so as to form the said coupling holographic lens.

4,310,217
ACTIVE COUPLER BETWEEN AN OPTICAL BUS LINE AND ONE OF THE SUBSCRIBERS AND BUS LINE COMPRISING SUCH ACTIVE COUPLERS

Ossona de Mendez, Montlhery, and Jean J. Crosnier, Vanves, both of France, assignors to Souriau & Cie, Boulogne, France

Filed Jan. 31, 1980, Ser. No. 117,525
Claims priority, application France, Feb. 2, 1979, 79 02794
Int. Cl.³ H04B 9/00
U.S. Cl. 350—96.16 **10 Claims**



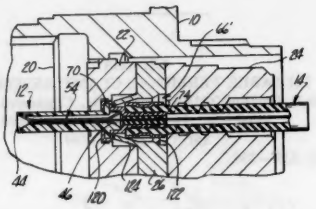
1. An optical amplifier comprising:
input means for delivering a first optical light beam;
partially reflecting and transmitting plate means including first and second reflecting surfaces, said first reflecting surface having a first input surface for receiving thereon the first light beam and for delivering a reflected light beam fraction and a transmitted light beam fraction of the first light beam;
photoreceiver means having an input for receiving the reflected light beam fraction and having an output for generating a first electrical signal which is a function of the light quantity received at said input;
electrical amplifier means having an input connected to the output of said photoreceiver means and having an output for delivering a second electrical signal which is an amplified signal of the first electrical signal and a function of the value of the first electrical signal;
photoemitter means having an input connected to the output of said electrical amplifier means for delivering a second optical light beam which is a function of said second electrical signal, and
the second optical light beam emitted being received on said second reflecting surface of said plate means and reflected therefrom, said second optical light beam being added to said transmitted light beam fraction for producing a third optical light beam; and
output means responsive to said second optical light beam and said transmitted light beam fraction for delivering said third optical light beam.

4,310,218
PIN AND SOCKET TERMINALS FOR FIBER OPTIC CABLES

James J. Karol, Unadilla, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 31, 1979, Ser. No. 71,640
Int. Cl.³ G02B 5/14
U.S. Cl. 350—96.21 **7 Claims**

1. A mateable pair of terminals for optically coupling first and second optical fiber cables, comprising:
a pin terminal having an axial channel extending from a rearward end to a forward end of the pin terminal;
means for securing the first optical fiber cable at the rearward end of the pin terminal so that a free end portion of the fiber extends partially through the channel, said channel being adapted to receive the second optical fiber cable removably extending into the forward end thereof;
a socket terminal having a forward end adapted to receive said pin terminal in telescopic relation;
means for securing the second optical fiber cable at the rearward end of the socket terminal so that a free end portion of the second optical fiber is exposed and extends partially through the forward end of said socket terminal; and
a coil spring having an engageable end extending into the

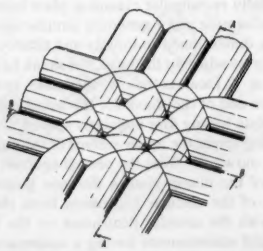


forward end of the socket for aligning the free end portion of the second optical fiber with the central axis of the socket, said coil spring engageable end being adjacent the free end of the second optical fiber and being retractable by engagement with said pin terminal,
whereby when the pin terminal is matingly engaged with said socket terminal, the free end portion of the second optical fiber enters the channel and the ends of the fibers are aligned and optically coupled.

4,310,219
LIGHT DIFFUSING SURFACE STRUCTURE FOR A LIGHT GUIDE IN AN INFORMATION DISPLAY

Pierre-Ernest Jaccard, Bienne, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Mar. 25, 1980, Ser. No. 133,757
Claims priority, application France, Apr. 13, 1979, 79 10414
Int. Cl.³ G02B 27/00, 5/02
U.S. Cl. 350—321 **7 Claims**



1. A surface of generally planar form having a diffusing surface structure for a light guide in a passive information display, said diffusing surface structure being formed at least in part of portions of surfaces of linearly extending circular cylinders having their axes parallel to the general plane, said cylinder surfaces being arranged to belong to at least two families with axes parallel to one another among the surfaces of each family and non-parallel to the axes of the surfaces of another family.

4,310,220
ELECTROCHROMIC DISPLAY WITH ONE POROUS SEPARATOR

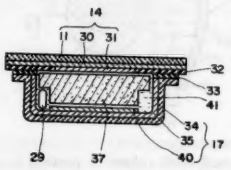
Hiroshi Kuwagaki, Joyo; Hiroaki Kato, Tenri; Sadatoshi Takechi, Nara; Hiroshi Nakauchi, and Yasuhiko Inami, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 871,618, Jan. 23, 1978, abandoned. This application Jul. 5, 1979, Ser. No. 54,918

Claims priority, application Japan, Jan. 24, 1977, 52-7116; Jan. 24, 1977, 52-7117; Jan. 24, 1977, 52-7118; Sep. 6, 1977, 52-107426

Int. Cl.³ G02F 1/17

U.S. Cl. 350—357 25 Claims



1. An electrochromic display cell comprising:

a pair of electrodes defining a first cavity therebetween;

a layer of electrochromic material disposed between said pair of electrodes;

separator means impregnated with a desired amount of electrolyte and disposed within said first cavity and between said pair of electrodes, said separator means defining a second and third cavity within said first cavity on opposite sides thereof; and

said second and third cavity absorbing the cubic expansion of the electrolyte when the electrolyte is subjected to increases in temperature.

4,310,221
VARIABLE SOFT-FOCUS LENS

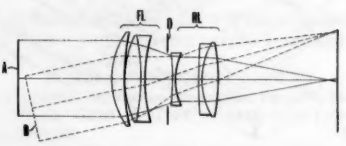
Kikuo Momiyama, Yokohama, and Shin Yamaguchi, Hiratsuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1979, Ser. No. 84,102

Claims priority, application Japan, Oct. 13, 1978, 53-126563

Int. Cl.³ G02B 9/34, 13/20

U.S. Cl. 350—431 3 Claims



3. A variable soft-focus lens comprising:

a displaceable front lens group comprising a positive meniscus lens with a convex surface at the object side and a positive compound meniscus lens consisting of a bi-convex lens and a bi-concave lens cemented on each other; and

a displaceable rear lens group comprising, in serial order, an aperture, a bi-concave lens with a strong surface at the image side and a positive compound lens consisting of a negative and a bi-convex lens cemented on each other;

the displacement amount of the front lens group toward the image side is different from that of the rear lens group whereby spherical aberration sufficient to realize the soft-focus effect is provided.

4,310,222
RETRO-FOCUS TYPE WIDE ANGLE LENS

Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Kanagawa, Japan

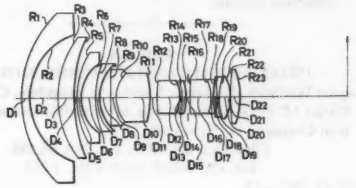
Continuation-in-part of Ser. No. 845,579, Oct. 26, 1977, abandoned. This application Apr. 18, 1979, Ser. No. 31,613

Claims priority, application Japan, Oct. 29, 1976, 51-130334; Apr. 21, 1978, 53-47511

The portion of the term of this patent subsequent to Sep. 5, 1995, has been disclaimed.

Int. Cl.³ G02B 13/04, 9/64

U.S. Cl. 350—432 19 Claims



1. A retro-focus type wide angle lens for forming an image of an object at an image plane comprising:

a divergent lens group including:

two sets of sub-lens groups each consisting of at least one first meniscus lens having a negative refractive power and a surface convex on the object side; and

a lens group arranged between said two sets of sub-lens groups and comprising meniscus lens convex on the object side, the surface of the lens group closest to the object being non-spherical for distortion compensation; and

a convergent lens group on the image side against said divergent lens group including:

a front lens group including a diaphragm, a second negative meniscus lens concave on the object side, and a biconvex lens in sequence from the diaphragm to the object so as to form a divergent air lens between said second negative meniscus lens and said biconvex lens; and

a rear lens group having a plural number of lens surfaces and provided on the image side with reference to the diaphragm, at least one of said lens surfaces being concave on the image side.

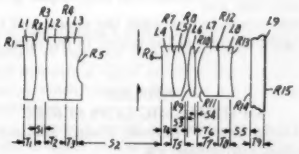
4,310,223
6 MM ULTRA-FICHE LENS

Lawrence H. Conrad, Maplewood, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Oct. 9, 1979, Ser. No. 82,704

Int. Cl.³ G02B 9/60

U.S. Cl. 350—465 5 Claims



1. An ultra-fiche high magnification lens system having an equivalent focal length of 6.17 mm and large aperture and comprising eight lens elements, a front portion of the system consisting essentially of three elements, a front positive meniscus lens, air-spaced from a negative doublet consisting of a positive biconvex element cemented to a negative biconcave element, and a rear portion of the system consisting essentially

of five elements together with a spaced glass platen, four of said five elements forming two doublets, a first positive doublet air-spaced from a biconvex positive element, air-spaced from the second positive doublet,

said elements forming the front portion of the system having the same diameter and the elements forming the rear portion of the system having the same diameter,

an aperture stop spaced between said front and rear portions of the system,

said second doublet of said rear portion of the system being spaced from the film plane defined on the rear of said platen by a distance greater than 7 mm, and

said eight lens elements having a vertex-to-vertex distance of less than 50 mm.

4,310,224

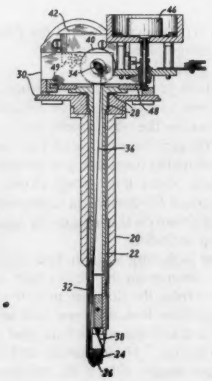
PRECISELY MOVABLE MIRROR MOUNT

August Weilbach, LaHabra; Charles W. Ragsdale, Concord, and Cories M. Perkins, Santa Ana, all of Calif., assignors to Cavitron Corporation, New York, N.Y.

Filed Oct. 23, 1979, Ser. No. 88,199

Int. Cl.³ A61B *3/02;* **F16C** *1/10*

U.S. Cl. 351—23 **10 Claims**



1. A precisely movable mirror mount device, comprising:

an elongated member;

a mirror pivotally supported on the member for rotation about an axis generally normal to the longitudinal axis of the member;

support means spaced along the member from the mirror for supporting the member for rotation about the longitudinal axis of the member;

a winch on the support means;

a strand windingly connected at one end to the winch and connected at the other end to the mirror at a distance from the rotation axis of the mirror for rotating the mirror in one direction; and

bias means connected between the mirror and the member for urging rotation of the mirror in the other direction.

4,310,225

OPHTHALMIC LENS SERIES

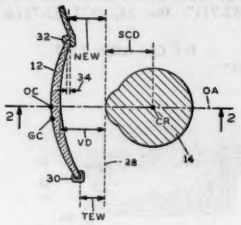
John K. Davis, East Woodstock, Conn., assignor to Gentex Corporation, Carbondale, Pa.

Filed Aug. 6, 1979, Ser. No. 63,706

Int. Cl.³ G02C *7/02*

U.S. Cl. 351—176 **26 Claims**

14. An ophthalmic lens series comprising a plurality of lenses formed of transparent material of a given refractive index, said lenses having convex spherical front surfaces and concave toric prescriptive rear surfaces with predetermined axial spacings therebetween, said prescriptive rear surfaces having base curvatures along the sphere meridians thereof and curvatures along the cylinder meridians thereof selected from respective families of curvatures differing by respective selected dioptric steps, said front surfaces having curvatures selected from a family of front curvatures differing in nominal power by selected dioptric steps and being so correlated with said rear surfaces and said predetermined axial spacings as to jointly provide a full range of ophthalmic prescriptive corrections of



spherical powers and such spherical powers in combination with negative cylindrical power, each in uniformly graduated steps of diopters and selected fractions thereof, each of said lenses having a finished prescriptive rear surface the true-power curvatures along the sphere and cylinder meridians of which differ from each other and from the corresponding curvatures of other lenses in said series by said selected fractions of a diopter.

4,310,226

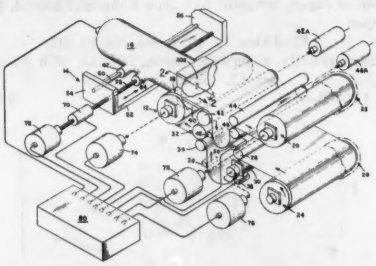
INDICIA RECORDING APPARATUS

Solomon Manber, Hoffstat La., Sands Point, N.Y. 11050; David Chiang, 649 Caledonia Rd., Dix Hills, N.Y. 11746, and Mosi Chu, 7 Four Winds Rd., Setauket, N.Y. 11733

Filed Jul. 31, 1980, Ser. No. 173,966

Int. Cl.³ B41B *21/08;* **G01D** *9/38;* **H04I** *15/34*

U.S. Cl. 354—5 **22 Claims**

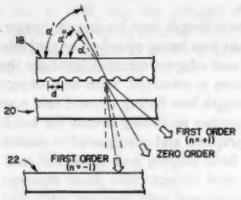


1. Indicia recording apparatus comprising: a supply reel for storing a roll of record medium; a takeup reel for accumulating record medium removed from said feed reel; a cylindrical supporting means intermediate said supply and takeup reels, for supporting a portion of the record medium, a carriage means controllably and repeatedly movable opposite said cylindrical supporting means and in a direction along the cylindrical axis of the latter, and a recording head on said carriage means, said recording head comprising radiation emitting means for emitting intensity modulated radiation toward said cylindrical supporting means along a plurality of equilength scan lines, each of said scan lines being in a different plane intersecting said cylindrical axis whereby during a single traverse of said carriage means a transverse band of the record medium is scanned.

4,310,227
DIFFRACTED ENERGY AUTO-RANGING SYSTEM FOR A CAMERA

Michael Zinchuk, Waltham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 5, 1981, Ser. No. 222,503
Int. Cl.³ G03B *3/00*
U.S. Cl. 354—25 **21 Claims**



1. A ranging system for a photographic camera for determining the distance-to-subject range, said system comprising:

a ranging sensor mounted on a camera for receiving light energy from the subject of principal interest in the scene to be photographed at an angle of incidence that varies as a function of the distance-to-subject range, said ranging sensor including means for diffracting the light from the subject of principal interest into spectral lines and including photo-responsive means mounted relative to said diffraction means for receiving a selected one of said spectral lines which images on a radiation receiving face thereof, the relative position on said radiation receiving face that the selected spectral line images varying as a function of the angle of incidence of the light from the subject of principal interest, said photo-responsive means having n segments that each provide a signal output responsive to the light imaged thereon; and

circuit means connected to the signal outputs of said n segments of said photo-responsive means for determining the relative position of the selected spectral line imaged on said radiation receiving face of said photo-responsive means and for determining the distance-to-subject range as a function of the so-determined relative position.

4,310,228
PHOTOGRAPHING APPARATUS FOR AN ENDOSCOPE

Masaaki Terada, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1979, Ser. No. 105,785
Claims priority, application Japan, Jan. 11, 1979, 54-1986
Int. Cl.³ G03B *15/03, 29/00*; A61B *1/04, 1/06*
U.S. Cl. 354—33 **5 Claims**

1. A photographing apparatus for an endoscope comprising:

an endoscope body including an observational optical system and a light guide;

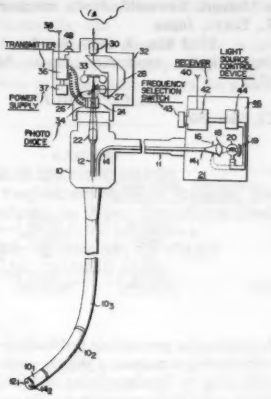
a light source for providing light to said light guide;

a photographing means mounted on a light path, through which an optical image obtained by light given to said light guide and led out through said observational optical system proceeds;

a photoelectric converting means disposed on said light path of said optical image for producing a brightness signal corresponding to the brightness of said optical image;

a transmitting means connected to said photoelectric converting means for producing a transmission signal corresponding to said brightness signal;

a receiving means connected by wireless means to said transmitting means for receiving said transmission signal and for producing a feedback signal corresponding to said brightness signal; and

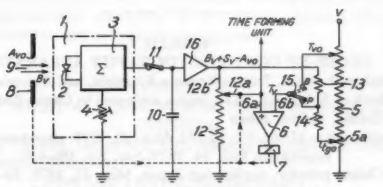


a control means for controlling said light source according to said feedback signal for controlling the quantity of light provided from said light source to said light guide.

4,310,229
METHOD AND APPARATUS FOR AUTOMATIC EXPOSURE CONTROL ON A PHOTOGRAPHIC CAMERA

Rolf Magel, Fernwald, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Nov. 14, 1979, Ser. No. 94,341
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1978, 2853067
Int. Cl.³ G03B *7/085*
U.S. Cl. 354—43 **13 Claims**



1. A method of automatically controlling exposure in a photographic camera with a lens equipped with an automatically adjusting diaphragm, said method comprising the steps of:

including in said camera a control device for setting a working aperture of said lens in response to a control signal;

providing a measuring signal proportional to a luminance of an object, a sensitivity of a film and an initial aperture of the diaphragm;

providing a reference signal by combining said measuring signal and a signal proportional to a shutter speed limit value;

electromechanically varying a signal proportional to said measuring signal in accordance with the actual diaphragm aperture;

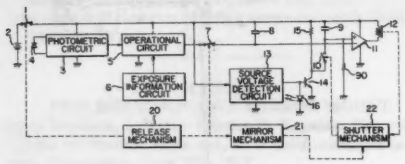
comparing continuously the electromechanically varying signal proportional to the actual diaphragm aperture with said reference signal; and

providing said control signal when said signals in said comparing step are equal.

4,310,230
APPARATUS FOR PREVENTING MALFUNCTION OF AN ELECTRIC SHUTTER DEVICE

Ryuzo Motoori, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 3, 1980, Ser. No. 126,349
Claims priority, application Japan, Mar. 30, 1979, 54-40672[U]
Int. Cl.³ G03B *17/20*
U.S. Cl. 354—50 **5 Claims**



1. Apparatus for preventing malfunction of an electric shutter device having a magnet, a shutter control circuit to initiate shutter closing by demagnetizing said magnet after releasing the shutter and a shutter mechanism for preventing the shutter from opening or closing whenever the attraction force of said magnet lowers below a certain determined value before releasing the shutter, said apparatus comprising:

a source voltage detection circuit for detecting the source voltage and producing a signal at its output terminal when the detected source voltage is at a level lower than a certain determined value and

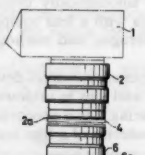
means operatively connected to the output terminal of said source voltage detection circuit and being responsive to said signal to demagnetize said magnet, said means being related to said shutter control circuit in such manner that said circuit can demagnetize said magnet before releasing the shutter,

said shutter control circuit comprising a timing circuit and demagnetizing said magnet when said timing circuit has completed counting a predetermined time after releasing the shutter; said means bringing the timing circuit into its counted-up position.

4,310,231
CLOSE-UP COPY PHOTOGRAPHY APPARATUS

Yuichiro Konishi, Tokyo; Nozomu Kitagishi, and Akiyasu Sumi, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 22,332, Mar. 20, 1979, abandoned. This application Oct. 14, 1979, Ser. No. 196,440
Claims priority, application Japan, Mar. 27, 1978, 53-39257
Int. Cl.³ G03B *3/00, 15/02, 17/48, 7/18*
U.S. Cl. 354—79 **3 Claims**



1. A photographic assembly for performing close-up and copy photography comprising, in combination:

a camera adapted to have a zoom lens exchangeably mounted thereon in operative relationship therewith;

a zoom lens mounted at one end thereof on said camera, said zoom lens including a lens barrel and being structured to perform zooming operations with the overall length of said lens barrel remaining unchanged, said zoom lens having a mechanism associated with an automatic exposure control mechanism of said camera for automatically controlling the exposure;

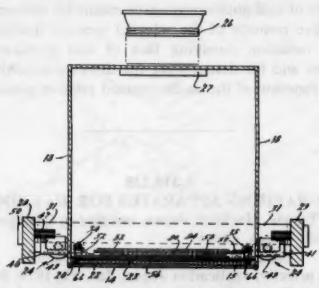
an adapter member having connecting means at opposite ends thereof for attachment of lenses thereto, said adapter member being connected to said zoom lens at an end of said zoom lens opposite said one end mounted to said camera;

a fixed focal length lens having an image side and an object side, said lens being attached to said adapter member at an end of said adapter member opposite the end at which said zoom lens is attached, with said object side of said fixed focal length lens facing toward said zoom lens; and a fixed base member including means for holding an object to be photographed and configured to enable illumination of an object held therein and to permit said camera to photograph said object, said base member including means connecting said base member with said fixed focal length lens in operative relationship with said photographic assembly with said image side facing toward said means for holding an object to be photographed to enable operation of said assembly to photograph an object mounted in said base member, with the length in the optical direction of said assembly being maintained constant by operation of the combination of said camera, said zoom lens, said adapter member, said fixed focal length lens and said base member.

4,310,232
PHOTOGRAPHIC APPARATUS AND METHOD FOR ADDING ARTIFICIAL BACKGROUNDS

Richard F. Reed, 27836 Forestbrook, Farmington Hills, Mich. 48018

Filed Oct. 12, 1979, Ser. No. 84,085
Int. Cl.³ G03B *15/10, 11/00*
U.S. Cl. 354—125 **10 Claims**



1. A photographic apparatus for artificially adding a desired background to a photograph of an inanimate subject during the photographic process, including:

a camera having a removable film plate, a fixed frame for holding said plate in a fixed position in said camera, and a lens and shutter for exposing said film plate;

first and second masking plates rotatably supported within said camera and adapted to be positioned in an operative position aligned with said film plate and an inoperative position non-aligned with said film plate;

a background transparency attached to said first masking plate;

a subject mask attached to said background transparency;

a background mask attached to said second masking plate; and

registration means for controlling the orientation of said masking plates relative to said film plate so that said back-

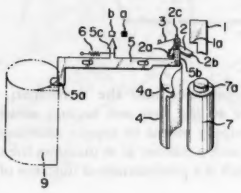
ground and subject masks can be aligned with the projection of the subject through the lens of the camera when said masking plates are in said operative position.

4,310,233

FILM FEED DETECTING DEVICE OF A CAMERA

Takeshi Okuyama, Kawasaki; Toshiaki Hozumi, Tokyo, and Hiroshi Wakabayashi, Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 9, 1980, Ser. No. 195,492
Claims priority, application Japan, Oct. 13, 1979, 54/132175; Dec. 28, 1979, 54/172192; Dec. 28, 1979, 54/172193
Int. Cl.³ G03B *1/04, 17/26*
U.S. Cl. 354—212 10 Claims



6. In a camera including a film feeding device including a take-up spool adapted to be rotated by a wind-up operating device to thereby take up on the outer periphery thereof a roll film loaded into a supply chamber, and a shutter device for effecting the light-interception to said film and the exposure control, the improvement comprising:

(a) take-up detecting means for generating an output when the winding of said film round said take-up spool has been completed; and

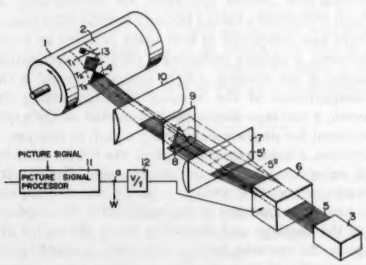
(b) shutter restraining means for restraining the operation of said shutter device, said shutter restraining means releasing said restraint in response to the output of said take-up detecting means.

4,310,234

SUPPLEMENTARY AMOUNT OF DEVELOPING SOLUTION DETERMINING METHOD FOR A FILM DEVELOPER

Seiya Sakamoto, Kyoto; Isao Saito, Shiga; Makoto Hirosawa, Kyoto, and Tetsuo Hohki, Ibaraki, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 22, 1980, Ser. No. 189,184
Claims priority, application Japan, Oct. 4, 1979, 54-128809
Int. Cl.³ G03D *3/02;* H04N *1/22*
U.S. Cl. 354—298 6 Claims



1. A method for determining a supplementary amount of a developing solution for use in a film developer, comprising the steps of:

(a) counting up values of width signals for controlling a halftone dot generator of a picture reproducing machine, while a reproduction picture is recorded on a photosensitive film by the halftone dot generator according to picture signals which are obtained by scanning an original picture photoelectrically; and

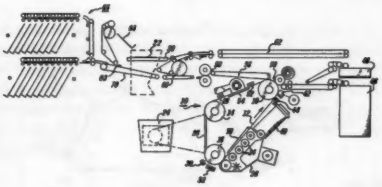
(b) determining a supplementary amount of the developing solution according to the counted-up total value of the width signals prior to the development of the photosensitive film.

4,310,235

JOB PROGRAMMING

Joseph A. Lorenzo, Penfield, and Henry E. Mannella, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 13, 1980, Ser. No. 129,929
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—6 6 Claims



2. A reproduction machine for providing a set of reproductions of a document set, the reproductions generally having first features, including the means to select one of the document set to provide second features for the reproductions of said one of the document set comprising

a sensor determining first features generally selected for the document set and also for determining second features for at least one of the document set;

means for selecting said at least one document from said document set; and

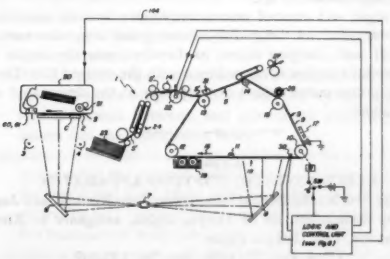
means for automatically conditioning the machine to make reproductions according to the second features determined for said at least one document.

4,310,236

COPY SHEET ALIGNMENT FOR FLASH-ON-THE-FLY COPIERS

John L. Connin, Longwood, Fla., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 12, 1979, Ser. No. 84,332
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH 12 Claims



1. In a copier having an image forming member, means for producing images at or proximate to a nominal position on the image forming member and means for forming visible repre-

sentations of such images on such member which are transferable onto copy sheets, the improvement comprising:

adjustable means for registering and feeding copy sheets into alignment with such transferable representations;

means for providing an error signal representative of a positional deviation of a transferable representation on the image forming member from a nominal position; and

means responsive to said error signal and operatively associated with said adjustable means for causing such adjustable means to positionally align a copy sheet with the transferable representation exhibiting said deviation.

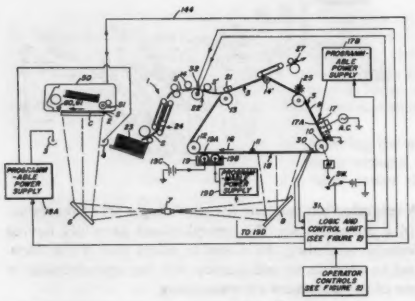
4,310,237
ADJUSTING COPY CONTRAST AND DENSITY

Robert D. Gengelbach, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 25, 1980, Ser. No. 143,189

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 E **3 Claims**



1. In copy solid area, contrast and density adjusting apparatus for use in a copier that uses a chargeable photoconductor to produce copies of originals, said apparatus having adjustable charging means for varying the voltage level V_o applied onto the photoconductor; and adjustable exposure station for varying the level of the copier exposure E_o, a stored matrix of sets with each set having at least two different values which correspond respectively, to specific levels of V_o and E_o, for a design standard, that cause a copier that meets such design standard to produce copies having solid area contrast and density in accordance with a desired Din/Dout response curve wherein Din refers to original document reflective density and Dout refers to copy reflective density; and means for designating a particular set; the improvement comprising:

(a) means for correcting the designated set values of E_o and V_o in accordance with variations in a copier from the design standard; and

(b) logic and control means responsive to said corrected designated set values for adjusting said exposure station and said charging means to thereby cause the copier to produce copies in accordance with the desired Din/Dout response curve which corresponds to the designated set values.

4,310,238
ELECTROSTATIC COPYING APPARATUS

Manabu Mochizuki; Seiichi Miyakawa; Taro Kimura, and Junichiro Hashimoto, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

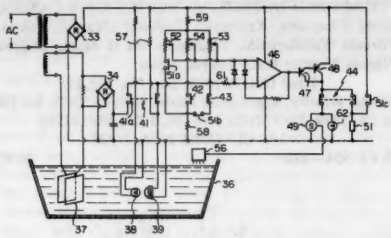
Filed Aug. 27, 1980, Ser. No. 181,609

Claims priority, application Japan, Sep. 8, 1979, 54-115555; Dec. 3, 1979, 54-156529

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 D **13 Claims**

1. An electrostatic copying apparatus including container means for containing a liquid developer having a liquid carrier and toner particles despersed in the carrier, characterized by comprising: first sensor means for sensing an electrical resistivity of the developer; second sensor means for sensing an optical transmissibility of the developer; supply means for supplying



additional toner particles into the developer; and control means responsive to the first and second sensor means for controlling the supply means to supply additional toner into the developer in such a manner as to maintain the transmissibility at a value which is a predetermined function of the resistivity.

4,310,239
REPRODUCTION CAMERA APPARATUS

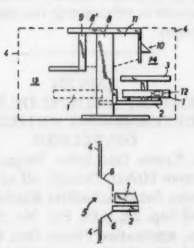
Harald Krzyminski, Wiesenstr. 14, D-6240 Koenigstein, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 948,757, Oct. 5, 1978, abandoned. This application Feb. 12, 1980, Ser. No. 120,898

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1977, 2745115

Int. Cl.³ G03B *27/00*

U.S. Cl. 355—18 **4 Claims**



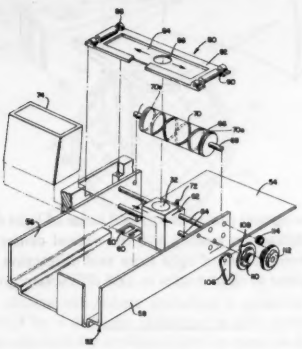
1. A reproduction camera apparatus for reproducing an original, which comprises a closed housing substantially impermeable to light and comprised of four walls defining an exposure compartment, a camera including a photographic optical system mounted in the housing, a light source arranged in the exposure compartment of the housing for illuminating the original therein, a carriage displaceably mounted in the exposure compartment for displacement along a path in relation to the optical system, a holder for the original, the holder defining a plane and being mounted on the displaceable carriage for movement onto and off the carriage in said plane, at least one of the walls having an opening in alignment with the displacement path of the carriage and extending along the entire displacement path, the opening having a dimension enabling the holder to be moved into and out of the exposure compartment of the housing onto and off the carriage through the opening, and a light shielding element associated with the opening and displaceable with the carriage, the shielding element defining a slot through which the holder may be moved for passing through the wall opening.

4,310,240

PHOTOGRAPHIC APPARATUS WITH MOVABLE LENS

Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 29, 1979, Ser. No. 88,766
Int. Cl.[3] G03B 27/44
U.S. Cl. 355—54 8 Claims



1. Photographic apparatus for sequentially exposing a plurality of image areas on a single card-like film unit in response to successive operating cycles of said apparatus, said apparatus comprising:

means for supporting such a film unit at a film plane;

means for defining an object plane having a center and being optically arranged in opposed spaced parallel relation to said film plane;

means for defining a plurality of fixed separate equal sized image areas arranged with equal spacing between centers thereof in a linear row on the film unit at said film plane;

a lens for forming an image at said film plane of an object located at said object plane;

means for mounting said lens for movement relative to said object plane center and said row of image areas along a path of travel with the optic axis of said lens mutually optically perpendicular to said object plane and said film plane;

exposure means operative during each operating cycle of said apparatus for effecting passage of image forming light through said lens to expose an image area; and

means responsive to successive operating cycles of said apparatus for automatically advancing said lens along said path of travel in increments which locate said lens at successive imaging positions whereat said lens is offset from the center of each respective image area, not directly aligned with said object plane center, by a distance so that the rear nodal point of said lens lies on a direct line extending between said object plane center and the center of a corresponding one of said image areas whereby an image formed by said lens of an object centered at said object plane is centered with respect to each corresponding nonaligned image area as well as a corresponding aligned image area.

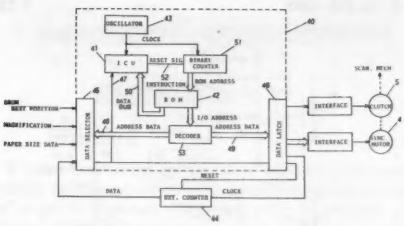
4,310,241

SYSTEM FOR CONTROLLING AN ORIGINAL IMAGE SCANNING FOR USE IN SLIT EXPOSURE TYPE IMAGE RECORDING APPARATUS

Kazuya Inoue, Musashino, Japan, assignor to Katsuragawa Electric Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1980, Ser. No. 121,360
Claims priority, application Japan, Feb. 14, 1979, 54-16475
Int. Cl.[3] G03B 27/32; G03G 15/28
U.S. Cl. 355—60 22 Claims

1. A system for controlling an original image scanning for use in a slit exposure type image recording apparatus adapted to project an original image through slit exposure over an image recording medium moving at a predetermined speed, which comprises an oscillating means for generating an output of a predetermined frequency, a first pulse counting means supplied with the output from said oscillating means and magnification data corresponding to a desired image magnification



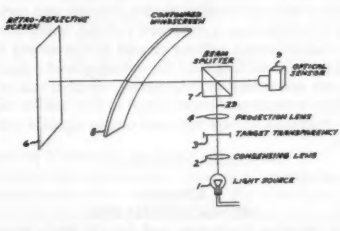
ratio and generating output pulses of a predetermined frequency, a power amplifying means receiving said output pulses from said first pulse counting means and generating a power output of a predetermined frequency corresponding thereto, and a synchronous motor for conducting the original image scanning while driven by the power output from said power amplifying means.

4,310,242

FIELD TEST UNIT FOR WINDSCREEN OPTICAL EVALUATION

Louis V. Genco, Enon, and Harry L. Task, Montgomery County, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 1, 1980, Ser. No. 136,210
Int. Cl.[3] G01N 21/41
U.S. Cl. 356—128 6 Claims



1. An apparatus for measuring the optical characteristics of a transparent body, comprising:

means for generating and projecting a beam of light along a first optical axis;

means for redirecting onto a second optical axis a portion of the light beam projected along the first optical axis, said means located between said generating and projecting means and the transparent body;

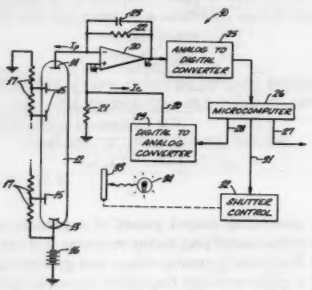
a planar retro-reflective screen positioned orthogonal to and intersecting the second optical axis at an image plane of the projected light beam portion after it has been redirected by said redirecting means and has passed through the transparent body; and

an optical sensor positioned in substantial alignment with the second optical axis for sensing and recording an image of the light beam portion after it has been reflected from the retro-reflective screen and has passed back through the transparent body and redirecting means along the second optical axis to said optical sensor.

4,310,243
SPECTROPHOTOMETER WITH PHOTOMULTIPLIER TUBE DARK SIGNAL COMPENSATION

James R. Brown, Garden Grove, and Allen M. Diamond, Huntington Beach, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 19, 1979, Ser. No. 86,388
Int. Cl.³ G01J 3/00, 1/44; H01J 40/14
U.S. Cl. 356—300 7 Claims



1. In a spectrophotometer including a source of light, a detector responsive to said light for producing a signal proportional to the intensity thereof, and an operational amplifier responsive to the signal from said detector for generating an output signal proportional to intensity, said operational amplifier having inverting and non-inverting inputs and an output, the signal from said detector being applied to said inverting input of said operational amplifier, and a low pass filter coupled between said inverting input of said operational amplifier and said output thereof for filtering the signal applied to said inverting input, the improvement comprising:

means for establishing a dark condition for said detector; and

feedback means for adjusting the output signal of said operational amplifier to zero volts during said dark condition, said means including means responsive to said output signal of said operational amplifier during said dark condition for generating a reference voltage, means for applying said reference voltage to said non-inverting input of said operational amplifier for reducing said output signal to zero, and means for determining whether said reference voltage reduces said ouput signal to zero and for adjusting said reference voltage until said output signal is reduced to zero.

4,310,244
MONOCHROMATOR

Charles V. Perkins, Cambridge, and John R. Firth, Silverstone, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 27, 1980, Ser. No. 125,010
Claims priority, application United Kingdom, Mar. 2, 1979, 07535/79
Int. Cl.³ G01J 3/18
U.S. Cl. 356—334 14 Claims

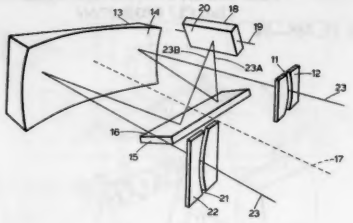
1. An Ebert monochromator comprising:

a concave spherical mirror,

means for defining first and second slits lying in a plane perpendicular to the central optical axis of said concave spherical mirror,

a diffraction grating pivotable about an axis parallel to diffraction grooves of said grating and being positioned off of said central optical axis of said concave spherical mirror, wherein said axis is parallel to said central optical axis of said concave spherical mirror,

beam directing means for receiving from said concave spherical mirror a beam of light which passes through said first slit and directing said beam to said diffraction grating, and for receiving a reflected beam of light from said diffraction grating and directing said reflected beam of light to said concave spherical mirror to pass through said second slit,

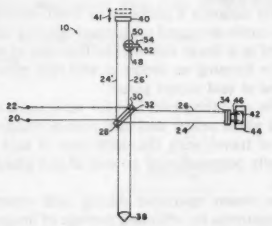


wherein the optical center line of said beam of light directed to said diffraction grating and the optical center line of said reflected beam of light from said diffraction grating lie in a plane at right angles to said diffraction grooves.

4,310,245
INTERFEROMETER SYSTEM

James L. Pritchard, 52 Needham St., Norfolk, Mass. 02056

Filed Mar. 19, 1980, Ser. No. 131,753
Int. Cl.³ G01B 9/02
U.S. Cl. 356—345 1 Claim



1. In a system having in Michelson interferometer arrangement, the following components defining a data channel and a reference beam channel:

a data beam source,

a reference beam source,

a beam-splitter,

a fixed mirror assembly with adjustment means therefor,

a moving mirror and means for moving same,

detector means

and means for adjusting phase delay,

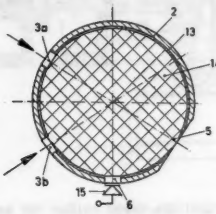
the improvement comprising:

said means for adjusting phase delay consisting of means for adjusting phase delay of said reference beam relative to said data beam in establishing zero optical path difference to the data beam, including a transparent optical plate in the reference beam channel but out of the data beam channel, means providing for rotating the transparent optical plate for increasing the optical thickness thereof relative to the reference beam channel, means for simultaneously adjusting the reference beam and the data beam, including said fixed mirror being unitary and in both the data beam channel and the reference beam channel and having adjustment thereon, said transparent optical plate being plane-parallel in configuration and located between said beamsplitter and said moving mirror.

4,310,246
PHOTOMETER SPHERE

Vladimir Blazek, No. 14, Butzweide, 5100 Aachen, Fed. Rep. of Germany

Filed Mar. 5, 1980, Ser. No. 127,356
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1978, 2834982
Int. Cl.³ G01J 1/04
U.S. Cl. 356—236 13 Claims

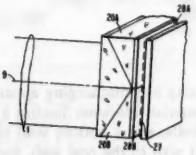


1. A photometer sphere including a spherical interior encompassed by a diffusely reflecting means, provided with at least one aperture for incident light, an aperture for applying a sample and an aperture for a photo detector in the diffusely reflecting means, wherein the interior is filled completely with an optically homogeneous, clear and non-scattering liquid or solid material.

4,310,247
METHOD AND APPARATUS FOR ANALYZING THE STATE OF POLARIZATION OF RADIATION

Hans-Erdmann Korth, Stuttgart, and Franz Schedewie, Boeblingen, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 21, 1980, Ser. No. 123,160
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1979, 2916202
Int. Cl.³ G01B 9/02
U.S. Cl. 356—365 1 Claim

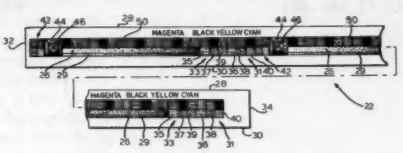


1. Apparatus for analyzing the state of polarization of radiation comprising:
- a beam splitter in the path of said radiation, said beam splitter including first and second Wollaston prisms which are equal to each other and are arranged one beside the other and rotated by 180 degrees relative to each other,
- first and second analyzers provided behind said first and second Wollaston prisms with the axes of polarization of the two analyzers being arranged symmetrically about an angle of 45 degrees relative to the polarization of the light beams exiting from said Wollaston prisms,
- and a linear light detector arrangement provided behind said analyzers, said light detector including a photodiode array.

4,310,248
COLOR CONTROL SYSTEM

Nolan J. Meredith, 251 North Rd., Oyster Bay Cove, N.Y. 11771

Filed Apr. 24, 1980, Ser. No. 143,177
Int. Cl.³ G01J 3/46, 3/52
U.S. Cl. 356—402 20 Claims

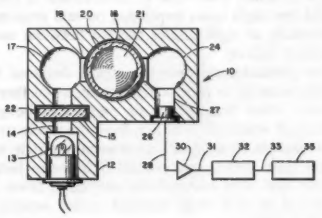


1. A color control system for color analysis in the color separation, developing and printing fields comprising; a plurality of strips of film each containing color information and combining when printed to form a color proof, and grey balance means on the proof visible from highlight through shadow to render grey when all colors are trapping correctly and show color contamination on the proof when the colors are not trapping correctly to indicate required adjustments in order to control the color produced.

4,310,249
SPECTROPHOTOMETER

Donald L. Kramer, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 9, 1979, Ser. No. 82,674
Int. Cl.³ G01J 3/50
U.S. Cl. 356—414 3 Claims

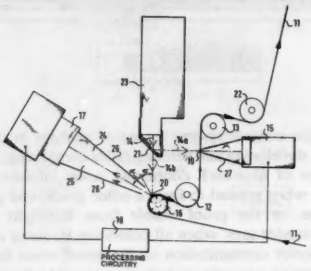


1. Spectrophotometer apparatus comprising:
- a discontinuous light source capable of producing a light characteristic of at least 5,000° K for a duration of from about one microsecond to about 100 microseconds;
- a first light integrating sphere capable of uniformly diffusing light from said light source;
- means defining a first light transmission path for the passage of light from said light source to said first light integrating sphere;
- a second light integrating sphere capable of uniformly diffusing light;
- a cylindrical liquid sample cuvette positioned between said first and second light integrating spheres;
- means defining a second light transmission path for the passage of light from said first light integrating sphere through said sample cuvette to said second light integrating sphere, said second light transmission path being aligned at an angle to the first light transmission path;
- photodetection means; and
- means defining a third light transmission path for the passage of diffused light directly from said second light integrating sphere to said photodetection means, said third light transmission path being aligned at an angle to the second light transmission path.

4,310,250
APPARATUS FOR MONITORING FOR FAULTS IN TRANSLUCENT STRIP MATERIAL

Erwin Sick, Icking, and Klaus Ostertag, Munich, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH, Waldkirch, Fed. Rep. of Germany

Filed Feb. 1, 1980, Ser. No. 117,720
Int. Cl.³ G01N *21/89*
U.S. Cl. 356—431 **5 Claims**



1. Apparatus for monitoring for faults in translucent strip material comprising:

first and second spaced apart rollers for supporting the strip material;

transport means for continuously moving the strip material in tensioned condition between the first and second spaced apart rollers;

optical scanning means for projecting first and second light beams at said strip material to effect line scanning thereof in a direction transverse to its direction of transport with said first light beam impinging on said strip material substantially at right angles thereto between said first and second rollers;

a first photoelectric detector means disposed behind said strip material to receive light transmitted therethrough;

a third roller having an air permeable peripheral wall through which air is blown from the inside to the outside to maintain an air cushion between said strip material and said third roller, said second light beam being directed onto said strip material for reflection from the surface thereof as said strip material passes around said third roller; and

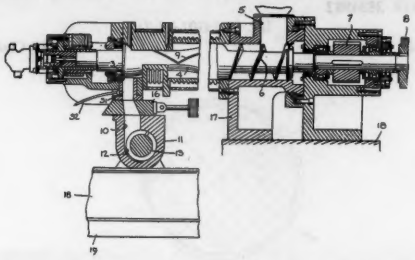
a second photoelectric detection means for detecting light reflected from the surface of said strip material.

4,310,251
CONTINUOUS MIXER INTERNAL PRESSURE CONTROL

Hans R. Scharer, Wallingford; Dominic A. D'Amato, Cheshire; Peter Hold, Milford, and Manfred Hubner, New Haven, all of Conn., assignors to Intercole Automation, Inc., Cleveland, Ohio

Continuation of Ser. No. 584,334, Jun. 6, 1975, abandoned, which is a continuation of Ser. No. 338,534, Mar. 6, 1973, abandoned, which is a continuation of Ser. No. 91,351, Nov. 30, 1970, abandoned. This application Nov. 5, 1976, Ser. No. 739,354
Int. Cl.³ B29B *1/10*
U.S. Cl. 366—77 **3 Claims**

1. An apparatus for continuously processing thermoplastic material under controllable pressure and including a barrel forming at least one substantially cylindrical material working chamber having a material charging orifice adjacent to one end and a material discharge orifice adjacent to the other end, means for substantially continuously feeding material to said chamber through said charging orifice at a controllable rate, a mixing rotor extending axially in said chamber, means for rotating said rotor, said rotor having axially extending blade portions twisting away from the direction of rotation and portions twisting in the direction of rotation, means on said rotor between said charging orifice and said blade portions for substantially continuously pushing material fed to said chamber toward said discharge orifice, a gear type pump having an

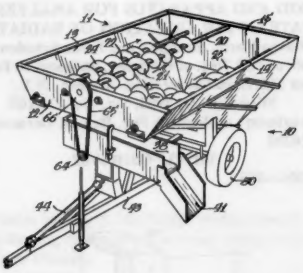


inlet connected to said discharge orifice for engaging and moving material entering therein through said inlet and means for rotating said gear type pump at a variably controlled rate for applying a variable back pressure to the material fed through said orifice.

4,310,252
CATTLE FEEDING DEVICE

Kelly P. Ryan, Blair, Nebr., assignor to Blair Manufacturing Company, Blair, Nebr.

Filed Aug. 6, 1980, Ser. No. 175,882
Int. Cl.³ B10F *7/08*
U.S. Cl. 366—186 **4 Claims**

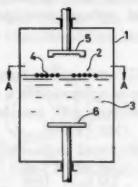


4. A cattle feed mixing and discharging apparatus comprising a generally rectangular container having a front wall, a rear wall, two side walls, and a bottom wall slanting downwardly from the front wall to the rear wall, means mounting said container for ground traversing movement, a plurality of augers rotatably mounted in the container including a first plurality of augers extending horizontally from the front wall to the rear wall, a second plurality of augers extending downwardly from the front wall to the rear wall and closely adjacent the bottom wall, a discharge chute near the juncture of the bottom wall and the front wall, a gate controlling the chute, a discharge conveyor positioned beneath the discharge opening and extending parallel to and beyond the front wall, drive means for rotating the augers in a direction whereby the first plurality of augers mix and move feed in the container from the front wall toward the rear wall, and the second plurality of augers mix and move feed from the lower portion of the rear wall upwardly toward the front wall, and means for operating the gate to open the chute to cause mixed feed to be discharged onto the discharge conveyor.

4,310,253
STIRRING METHOD

Eizo Sada, Takatsuki; Shigeo Katoh; Ryozo Toei, both of Kyoto, and Hideyuki Michiki, Mobara, all of Japan, assignors to Toyo Engineering Corporation, Tokyo, Japan

Filed Mar. 24, 1980, Ser. No. 132,847
Claims priority, application Japan, Mar. 29, 1979, 54-36230
Int. Cl.³ B01F *13/08, 13/10*
U.S. Cl. 366—273 **9 Claims**



1. Method for magnetically and selectively stirring substances in a vessel containing them, which comprises:

(a) placing a predetermined quantity of comminuted magnetic material at a preselected location in said vessel, said magnetic material being covered with a non-magnetic material so as to possess a predetermined specific gravity;

(b) placing in said vessel and above said comminuted magnetic material movable means for rotating said magnetic material under the influence of a variable rotating magnetic field generated by said movable means;

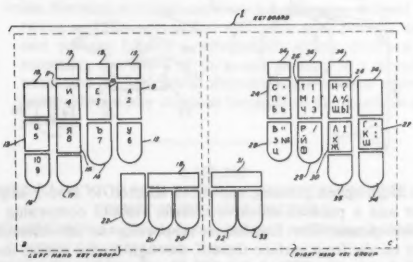
(c) adjusting said rotating magnetic field to a predetermined rotational speed and said movable means to a predetermined distance from said magnetic material; and

(d) causing said movable means to stir said substances selectively in said vessel, thereby obtaining a transfer of the thus stirred substances in said vessel.

4,310,254
KEYBOARD DEVICE FOR PROCESSING LINGUISTIC INFORMATION

D'Angiolillo; Encho Y. Karmakov; Kiril T. Shakrachki; Metodi T. Shakrachki; Stoyan H. Stoyanov; Todorka N. Vassileva, and Todor P. Trifonov, all of Sofia, Bulgaria, assignors to Cuv "Progress", Sofia, Bulgaria

Continuation-in-part of Ser. No. 900,115, Apr. 26, 1978, abandoned. This application Feb. 29, 1980, Ser. No. 125,918
Claims priority, application Bulgaria, Apr. 26, 1977, 36127
Int. Cl.³ B41J *5/00, 5/10*
U.S. Cl. 400—109 **15 Claims**

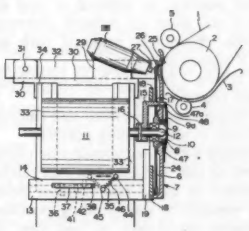


1. A device for the introduction of linguistic information comprising a keyboard unit, an electronic processing unit and an output registration unit, the keyboard unit having keys for symbols distributed into a right hand side group to be operated by the right hand and a left hand side group to be operated by the left hand, the electronic processing unit containing a memory, a decoder and a control unit, the keyboard unit processing space keys, the keys for symbols in the right hand side group having priority over the keys for symbols in the left hand side group, the keys for symbols in the right hand side group having priority from left to right and from top to bottom, the keys for symbols in the left hand side group having priority from right to left and from top to bottom, with the keys for symbols in the outer end columns of both groups being located one row lower, with the keys for symbols in each group carrying a group of symbols arranged by priority, the symbols being presented once on the keys in the respective groups, the keyboard unit processing keys for the selection of symbols whose number is equal to the number of symbols form the greatest set of symbols carried by a single key for symbols and whose priority follows the priority of the symbols corresponding to them, a key for reversing the priority of the symbols on the keys for symbols, key for reversing the priority of the keys for symbols from the left hand side group with respect to the keys for symbols from the right hand side group, a key for reserving the priority of the keys for symbols in both groups, keys for, introduction of symbols from the left hand side group between symbols from the right hand side group and separate keys and groups of keys having the functions of writing of a capital letter, for passing to a new line, for passing to a new line with an indentation and a capital letter, and for writing of capital letters only.

4,310,255
PRINTER WITH CARTRIDGE TYPE WHEEL

Kiyomitsu Asano, Musashino, and Tetsuo Watanabe, Tokyo, both of Japan, assignors to Ricoh Co., Ltd. and Nihon Tsushin Gijyutsu Kabushiki Kaisha, both of, Japan

Filed Sep. 17, 1979, Ser. No. 76,389
Claims priority, application Japan, Sep. 18, 1978, 53/113585
Int. Cl.³ B41J *1/30*
U.S. Cl. 400—171 **22 Claims**



1. In a printer comprising a platen, a type wheel including a plurality of fingers arranged radially each carrying a type at the forward end, a printing hammer unit, an ink ribbon, a type selection motor and a carriage supporting the type wheel, hammer unit, ribbon and motor, movable along the platen, the printer being operable to print symbols on a sheet on the platen, wherein the improvement comprises:

a type wheel cartridge rotatably supporting the type wheel;

a cartridge holder for removably holding said type wheel cartridge mounted to the carriage for movement perpendicularly to the movement of the carriage between an operative and a standby position;

the type selection motor having a shaft and mounted to the carriage for movement parallel to the movement of said carriage holder between an operative and a standby position and axially of the type wheel; and

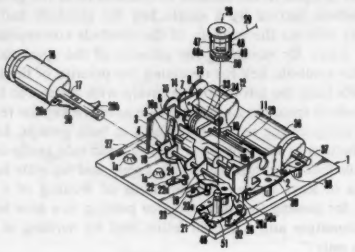
drive means for moving said cartridge holder and the type selection motor between the respective operative and standby positions, with a moving distance of the type wheel selection motor being greater than a moving distance of said cartridge holder so that the type wheel receives in the type wheel cartridge the type selection motor shaft when said cartridge holder and the type selection motor are both in their respective operative positions.

4,310,256

PRINTERS

Ikutaro Inoue, Morioka, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 815,714, Jul. 14, 1977, abandoned. This application Sep. 24, 1979, Ser. No. 77,797
Claims priority, application Japan, Jul. 15, 1976, 51-84346
Int. Cl.[3] B41J *1/24, 19/94*
U.S. Cl. 400—185 6 Claims



1. A printing mechanism including:

a carriage movable laterally along a printing line and including a type wheel rotatable to position a selected one of a plurality of type elements carried by said type wheel into a printing position along said printing line;

means for holding said carriage in a selected position along said printing line, said holding means including a resilient element biasing said carriage toward a first position along said printing line, a drum interconnected to said carriage by a string held to said drum for moving said carriage to a selected position by rotation of said drum, a ratchet secured to said drum for rotation therewith and a retention means operatively engaged with said ratchet for holding it against rotation;

a hammer having a hammer head extending longitudinally along said printing line;

means for feeding paper between said hammer head and the type element in said printing position;

means including a first electromagnetic plunger operatively connected to said hammer and said ratchet for pivoting said hammer to cause said hammer head to strike the printing element in said printing position through said paper during movement of said first electromagnetic plunger in a first direction, and for rotating said ratchet to turn said drum and move said carriage laterally to the next printing position along said printing line during movement of said electromagnetic plunger in a second direction; and

means for releasing said retention means from said ratchet to cause said carriage to return to said first position while actuating said paper feed means to advance said paper, said releasing and actuating means consisting essentially of a second electromagnetic plunger and means for transmitting motion from said second electromagnetic plunger to said retention means and said paper feeding means.

4,310,257

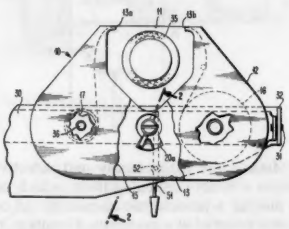
TYPEWRITER CARTRIDGE LOCK-DOWN

Thomas R. Field, and Mary L. VanArsdall, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1979, Ser. No. 103,818
Int. Cl.[3] B41J *32/00, 35/28, 35/22*
U.S. Cl. 400—208 1 Claim

1. A ribbon cartridge assembly for retaining and supporting a ribbon in a typewriter, said typewriter including a support for said cartridge assembly and an upstanding, centrally positioned post projecting from said support; an upstanding member mounted for rotation on said support, adjacent said post, and including a tab projecting from said member substantially perpendicularly thereto; said cartridge assembly comprising:

a first ribbon cartridge superimposed on a second cartridge, each of said cartridges comprising spaced apart top and bottom walls and a side wall joining said top and bottom walls adjacent the periphery thereof to form separate chambers, said side walls of each cartridge being discontinuous at predetermined locations to form at least entrance and exit apertures for separate ribbons; said bottom wall of said first ribbon cartridge and the top and bottom wall of said second ribbon cartridge including aligned



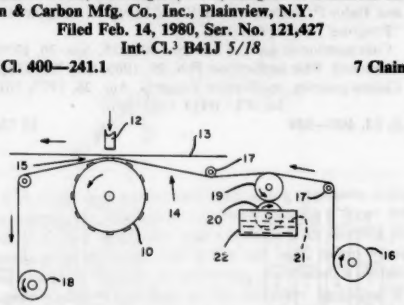
openings dimensioned for admitting therethrough said post, member and tab; said bottom wall of said first cartridge including a ramp adjacent to its said opening in its said chamber, said ramp having an inclined surface engageable by said tab; biasing means connected to said member for rotating said member and urging said tab into engagement with and upwardly of said inclined surface, to thereby force said first cartridge downwardly against said second cartridge and thereby lock said cartridge assembly against said support; and means connected to said member for effecting disengagement of said tab from said ramp against the urging of said biasing means.

4,310,258

INK RIBBON LUBRICATION BY LIQUID SILICONE OIL

Michael A. Scott, Huntington, N.Y., assignor to Columbia Ribbon & Carbon Mfg. Co., Inc., Plainview, N.Y.

Filed Feb. 14, 1980, Ser. No. 121,427
Int. Cl.[3] B41J *5/18*
U.S. Cl. 400—241.1 7 Claims



1. High speed printing apparatus adapted to feed a copy sheet and a pressure-sensitive transfer ribbon, comprising a flexible plastic film foundation supporting an ink-releasing layer on the front surface thereof, through a print station and to apply imaging pressure against the rear surface of said ribbon to cause imagewise transfer of ink from said layer to the surface of said copy sheet, said apparatus comprising a print station including an imaging element and a backing element spaced therefrom, means for forcing said elements together to impart an imaging pressure therebetween, means for feeding a said copy sheet through said print station so that the ink-releasing layer thereof is adjacent said copy sheet and the rear surface thereof is adjacent said imaging element, characterized by

the presence of means for applying a thin, substantially continuous liquid film of silicone oil to the said rear surface of the pressure-sensitive transfer ribbon at a location in advance of the movement of said ribbon into said print station so that said ribbon carries said film of silicone oil at the time that the rear surface thereof is engaged by said imaging element.

4,310,259

CAPILLARY NIBS FOR INSCRIBING INSTRUMENTS

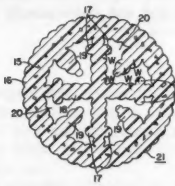
Akio Ito, Inazawa, and Masao Ito, Nagoya, both of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 723,133, Sep. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 523,876, Nov. 14, 1974, abandoned. This application Oct. 22, 1979, Ser. No. 87,304

Claims priority, application Japan, Nov. 19, 1973, 48-129881

Int. Cl.³ B43K *1/06*

U.S. Cl. 401—265 **6 Claims**



1. A capillary nib for use in an inscribing instrument, said nib being shaped from a bar of thermoplastic resin material which is formed by extruding the resin material in a molten state through a die having a large plurality of orifices disposed in a specified arrangement to thereby form a plurality of filaments of the resin material and causing the filaments to adhere longitudinally while the surfaces thereof are still substantially in the molten state, said bar having a transverse cross-sectional configuration comprising:

an outer shell portion formed of mutually adhering filaments;

a plurality of projections formed of mutually adhering filaments, said projections being integrally joined at respective bases thereof to said outer shell portion at equal angularly spaced intervals, said projections extending centripetally toward the axial center of the cross-section, at least a portion of said projections at equal angularly spaced intervals extending fully to said center and being integrally joined thereat; and

voids, forming principal capillary ink passages, defined between said projections and said outer shell portion, each said passage having a substantially linear direction of extension, the width of each said passage, in a direction transverse to said linear direction of extension thereof, being substantially constant throughout the length of said passage.

4,310,260

FIXING DEVICE FOR FIXING A HANDLE STEM TO A FRONT FORK AT A BICYCLE

Hitoshi Katayama, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 55,390, Jul. 6, 1979, abandoned. This application Dec. 4, 1980, Ser. No. 213,098

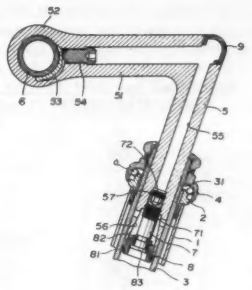
Claims priority, application Japan, Jul. 12, 1978, 53-96438[U]

Int. Cl.³ B62K *21/18*

U.S. Cl. 403—7 **5 Claims**

1. A handle stem for a bicycle front fork comprising:

a horizontal projecting portion having at a distal end thereof a handle bar holder and defining an axially central horizontally extending through hole, said handle bar holder comprising a handle bar retaining area, a pusher element facing the interior of said retaining area for engaging with a handle bar and screw means engaging with a screw thread provided in said horizontal through hole for biasing said pusher element toward the center of said retaining area; a vertically projecting portion comprising a vertical cylindrical member defining an axially central vertical through hole, an interior tapered surface at a portion of said vertical through hole, and an inner peripheral screw thread on said vertical through hole spaced from adjacent and above said tapered surface and spaced from and below the top of said cylindrical member; and, a handle expander assembly mounted within said vertical through hole and comprising a handle expander bolt having a length which is less than the length of said vertical through hole, a rotary control element for rotating said bolt, a screw



thread on the outer periphery of said expander bolt in engagement with the screw thread of said cylindrical member, and an expander cone having a tapered surface complementary to the tapered surfacce of said cylindrical member and carried by said expander bolt, said expander cone being vertically movable upon rotation of said expander bolt imparted by said rotary control element such that its tapered surface moves into engagement with or disengagement from the tapered surface of said cylindrical member to control the radial expansion of said cylindrical member and the locking thereof to said front fork; said horizontal and vertical through holes terminating in a common area permitting access to said screw means and rotary control element through said horizontal and vertical through holes, said expander bolt having a length which prevents its projection into said common area.

4,310,261

CONTROL MECHANISM FOR VIBRATORY ROLLER

Rudolph G. Opderbeck, Waukesha, Wis., assignor to Wacker Corporation, Milwaukee, Wis.

Filed Mar. 3, 1980, Ser. No. 126,560

Int. Cl.³ E01C *19/38*

U.S. Cl. 404—117 **7 Claims**

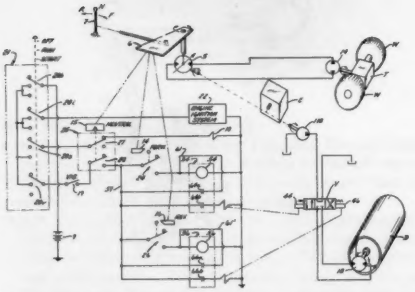
7. Control apparatus for a vibratory roller that comprises an exciter which is to operate only when the roller is moving and in a direction that corresponds to the direction of roller movement, said control apparatus comprising a member whereby direction and speed of roller movement are controlled and which is manually shiftable from a neutral position at which the roller is stopped in opposite directions through a range of forward positions and a range of rearward positions, said control apparatus further comprising a forward exciter control device which must be energized for forward operation of the exciter, a forward exciter switch which is associated with said forward exciter control device and which is closed only when said member is in its range of forward positions, a reverse exciter control device which must be energized for reverse operation of the exciter, and a reverse exciter switch which is

associated with said reverse exciter control device and which is closed only when said member is in its range of rearward positions, said control apparatus being characterized by:

A. cutout switch means responsive to the position of said member and arranged to be open only when said member is in its neutral position;

B. a pair of relays, one for each of said forward and reverse exciter control devices, each of said relays comprising
(1) a coil, and
(2) a set of contacts which are closed when said coil is energized;

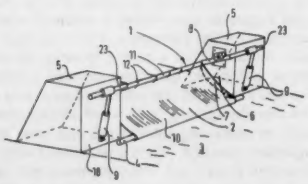
C. first conductor means connecting the set of contacts of each relay in a circuit comprising, in series,
(1) a current source, and
(2) the exciter control device for the relay, whereby each exciter control device is energized so long as the set of contacts of its relay is closed;



D. second conductor means connecting the coil of each relay in a circuit comprising, in series,
(1) said current source,
(2) said cutout switch means, and
(3) the exciter switch associated with the control device for the relay,
whereby the coil of each relay is energized by closure of its associated one of said forward and reverse exciter switches; and

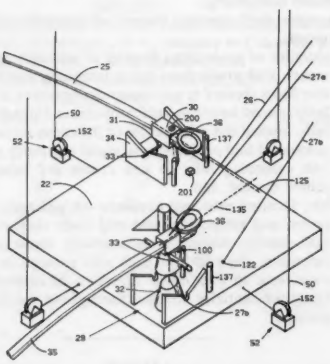
E. third conductor means connecting the coil of each relay with its set of contacts in a holding circuit that enables the coil of the relay, once energized by closure of its associated one of said exciter switches, to remain energized notwithstanding opening of that switch, so long as said member is not moved to its neutral position.

4,310,262
COLLAPSIBLE DAM AND APPARATUS FOR RAISING AND LOWERING THE DAM
Francesco Calza, Monza, and Bruno Borca, Milan, both of Italy, assignors to Pirelli/Furlanis Applicazioni, Gomma, Italy
Filed Mar. 31, 1980, Ser. No. 136,052
Claims priority, application Italy, Apr. 5, 1979, 21605 A/79
Int. Cl.³ E02B 7/20
U.S. Cl. 405—87 **3 Claims**



1. A device for raising and lowering a web of flexible, inextensible and waterproof material forming a dam arranged transversely of a waterway, one edge of the web being fixed to the bottom of the waterway while the opposite edge is supported so it can be raised and lowered by the device, said device comprising at least one rigid rod secured at one end to said supported edge of the web while the second end, opposite to the first end is secured to means for raising and lowering said first end comprising a pressure cylinder-piston assembly actuated by means of a fluid under pressure, one end of said assembly being attached to the ground and the other end of said assembly being attached to said second end of the rod, said rigid rod being further connected to a bank of the waterway by means of a hinged connection comprising a circular seat associated to an intermediate point of said rod, and a pin inserted in said seat, said pin being secured in such a way as to project from a wall of the waterway in which the web forms the dam whereby when said second end is displaced upwardly or downwardly by said pressure cylinder-piston assembly the rigid rod swings around said hinged connection thereby lowering or raising the first end and consequently also the web attached thereto.

4,310,263
PIPELINE CONNECTION SYSTEM
Arthur C. Daughtry, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.
Filed Jun. 27, 1980, Ser. No. 163,658
Int. Cl.³ F16L 1/04
U.S. Cl. 405—169 **16 Claims**



1. A method for making a flowline connection between the ends of two subsea pipelines with a connector assembly, said method comprising the steps of:

(a) attaching the end of a first pipeline to the connector assembly;

(b) displacing the connector assembly laterally along the sea floor in a direction substantially normal to the longitudinal axis of the first pipeline so that the end of a second pipeline terminates at the connector assembly;

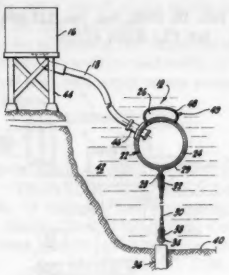
(c) attaching the end of the second pipeline to the connector assembly; and

(d) connecting the ends of the pipelines at the connector assembly so that the pipelines are in fluid communication.

4,310,264
BUOYANT PIPE SYSTEM

William L. Brownlee, 2070 University Ave., Berkeley, Calif. 94704

Filed Mar. 31, 1980, Ser. No. 134,997
Int. Cl.[3] F16L *1/04*
U.S. Cl. 405—172 10 Claims

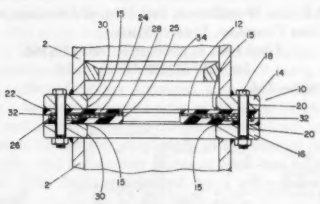


1. A submerged pipe system for underwater transport of liquids in a water body having an underlying bed comprising:
at least one pipe conduit having means for substantially equalizing inside and outside conduit pressures during underwater use;
a floatation chamber attached to said pipe conduit, said combined pipe conduit and floatation chamber having a positive buoyancy during underwater use;
anchor means attached to said pipe conduit for anchoring said combined pipe conduit and floatation chamber to the underwater bed wherein said pipe conduit and attached floatation chamber are located in an elevated location above the underwater bed.

4,310,265
PILE WIPER SEAL

Steven G. Streich, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 29, 1980, Ser. No. 126,060
Int. Cl.[3] E02B *17/00;* E02D *5/52*
U.S. Cl. 405—227 8 Claims

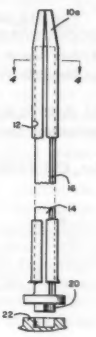


1. A pile wiper seal assembly sealing the annulus between either a tubular jacket leg or tubular pile sleeve and a pile inserted therethrough of a marine platform, said pile wiper seal assembly comprising:
annular wiper member means having a peripheral portion and a sealing portion extending inwardly therefrom having a centrally located aperture therein, said annular wiper member means comprising:
elastomeric member means;
annular reinforcing member means having a generally rectangular cross-sectional shape located in the peripheral portion of said annular wiper member means; and
annular reinforcing means extending throughout the peripheral portion and the sealing portion of said annular wiper member means terminating at the centrally located aperture therein and being secured to the annular reinforcing member means in the peripheral portion of said annular wiper member means; and
annular wiper member retaining means comprising:
a pair of annular plate means, each annular plate means of the pair being secured to the other by a plurality of fastening means extending through the elastomeric member means, the annular reinforcing member means and the annular reinforcing means of the peripheral portion of said annular wiper member means, said annular wiper member retaining means having at least one of the pair of annular plate means secured to either said tubular jacket leg or said tubular pile sleeve of said marine platform.

4,310,266
FRICTION ROCK STABILIZER AND METHOD OF INSERTING SAME IN AN EARTH STRUCTURE BORE

Richard G. Malsbury, Ringoes, and Wallace A. McGahan, Lawrenceville, both of N.J., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Mar. 10, 1980, Ser. No. 129,039
Int. Cl.[3] E21D *21/00, 20/00*
U.S. Cl. 405—259 6 Claims



1. A method of inserting an elongate, substantially tubular, friction rock stabilizer, which has a pair of substantially parallel, axially-extended and substantially linear edges along a substantial length thereof, into an undersized bore formed in an earth structure, to stabilize the structure, comprising the steps of:
forceably thrusting the stabilizer axially into the bore; and
rotating the stabilizer during at least a portion of the thrusting step; wherein
said rotating step comprises engaging only one of said edges with a tool, such as a mandrel or the like, and driving the one edge in rotation by rotating the engaged tool.

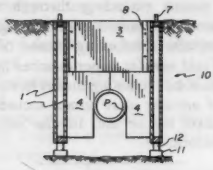
4,310,267
SAFETY TRENCH BOX

Clinton Davis, Rte. 1, Box 246 B, Corning, Calif. 96021

Filed Mar. 13, 1980, Ser. No. 130,087
Int. Cl.[3] E21D *5/00*
U.S. Cl. 405—283 8 Claims

1. A device for protecting workmen from trench cave-ins comprising, in combination:
a barrier means surrounding the perimeter of a work area having a depth substantially complemental to the depth of the trench wherein said barrier means includes first and second pairs of spaced parallel imperforate walls, each pair orthogonally offset and interconnected at wall termini so as to form a box having an open top and bottom face,
and an opening along a bottom area of said barrier means to

allow work to be introduced therethrough wherein said opening is formed on one wall of said first pair which defines end walls and said one wall includes a solid rigid panel upper portion interconnecting wall termini of said second pair and a lower panel formed from two symmetri-



cal half portions removeably depending from said upper panel and together forming a downwardly extending bifurcation defining said opening through which the work passes whereby said device provides open top and bottom areas to allow placement therein of pipes or the like and access to the trench bottom.

4,310,268

MINING EQUIPMENT

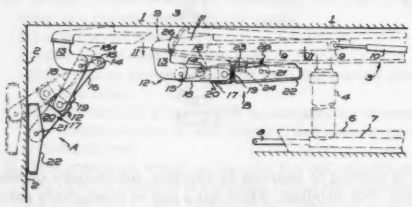
Lewis R. Bower, and Arthur Scarfe, both of Wakefield, England, assignors to Fletcher Sutcliffe Wild Limited, Wakefield, England

Filed Jul. 3, 1979, Ser. No. 54,426

Claims priority, application United Kingdom, Jul. 5, 1978, 28937/78

Int. Cl.³ E21D *23/00*

U.S. Cl. 405—294 **13 Claims**



1. A face sprag arrangement for supportingly engaging a mineral face and forming part of mining equipment, comprising a sprag plate, a generally elongate support member attachable to a section of mining equipment having a supported end and a free end, a piston and cylinder unit pivotally attached at one end about a first pivot axis to said sprag plate and at the other end about a second pivot axis to said support member proximate the free end thereof, a link means pivotally attached at one end about a third pivot axis to said piston and cylinder unit and at the other end about a fourth pivot axis to said support member at a second location also proximate said free end, but spaced from said second pivot axis, the spacing between said second and fourth pivot axes being less than the length of said link means, all said pivot axes being parallel, and said piston and cylinder unit being extendable for urging said sprag plate into a position for supporting engagement with said mineral face and retractable to retract said sprag plate from said mineral face supporting position, said piston and cylinder unit being rotatable between an operative, face supporting position and an inoperative, storage position, with the locating of the second and fourth pivot axes proximate the free end of said support member permitting said piston and cylinder unit to extend generally toward said mineral face when said unit is in the operative position to bring the sprag plate into engagement with said mineral face, and further permitting said piston and cylinder unit, when in the inoperative position, to extend generally away from said mineral face enabling said sprag plate to be disposed closely adjacent the underside of said support member in a folded, inoperative position.

4,310,269

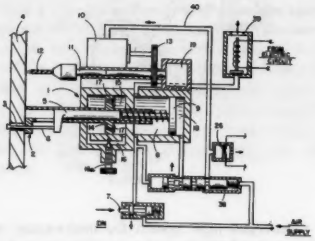
DRILL BREAK-THROUGH SENSOR

Horst W. Neu, Torrance; Thomas Gilmore, Carson, and Farrell A. McCann, Hawthorne, all of Calif., assignors to Northrop Corporation

Filed Feb. 19, 1980, Ser. No. 121,994

Int. Cl.³ B23B *47/18*

U.S. Cl. 408—11 **4 Claims**



1. An improved power drill of the type having means for rotating a drill bit, advancing and retracting means for advancing the drill bit into a workpiece and retracting the drill bit from the workpiece, wherein the improvement comprises:

(a) sensing means located on the drill side of the workpiece for sensing when the drill bit is encountering resistance from the workpiece; and

(b) control means connected to the sensing means for causing the advancing and retracting means to operate to advance the drill bit so as to bring the drill bit into contact with the workpiece, and to continue to advance the drill bit into the workpiece, and to retract the drill bit from the workpiece when the sensing means has sensed that the drill bit has ceased to encounter resistance from the workpiece.

4,310,270

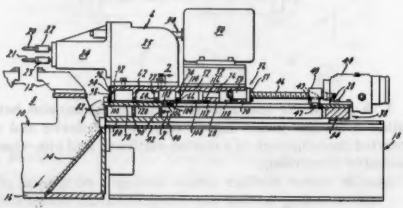
FEED UNIT

Siegfried Kraus, Wendlingen, Fed. Rep. of Germany, assignor to The Cross Company, Fraser, Mich.

Filed Feb. 8, 1980, Ser. No. 119,766

Int. Cl.³ B23B *47/00, 3/36*

U.S. Cl. 408—234 **16 Claims**



1. In a machine tool, a machining head supporting structure comprising

laterally spaced parallel ways;

a reciprocable saddle advanceable and retractable on said ways and adapted to carry a tool head;

a bed carrying said ways and supporting said saddle, said bed having top structural means attached to and extending between said ways for substantially the entire length thereof and providing a solid, continuous tie between said

ways whereby to minimize deflection and spreading thereof in use;

a center base provided with chip disposal means;

a wing base carrying said bed and positioning the forward end of said top structural means adjacent to said chip disposal means;

wiper means on said saddle snugly fitting said ways and the top portion of said bed operative to push chips accumulating on the latter ahead of the saddle when the latter is advanced on said ways; and

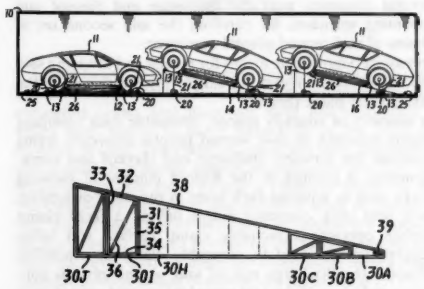
drive means for advancing and retracting said saddle on said ways operative to position said saddle at the forward limit of its travel with said wiper means proximate to said chip disposal means.

4,310,271

DISPOSABLE DUNNAGE SYSTEM FOR TRANSPORTING VEHICLES

Peter Canellis, 12 Hillburn Rd., Scarsdale, N.Y. 10583, and Thomas H. Mock, Colonial Blvd., NE., Canton, Ohio 44714

Filed May 19, 1980, Ser. No. 150,972
Int. Cl.³ B60P *3/07, 7/08*
U.S. Cl. 410—13 **11 Claims**



1. In a container transport system, for carrying a plurality of vehicles, including a cargo container and at least one ramp located within the container for compactly positioning the vehicles within the container, the improvement characterized by the formation of said at least one ramp from corrugated cardboard, said ramp comprising:

a plurality of load cells of increasing average height which are positioned next to each other, each cell being formed from cardboard panels arranged in a trapezoidal shape having a base, two parallel sides of different height, a top that is inclined between the parallel sides to such an extent as to meet the neighboring edges of the tops of the adjacent cells, and a diagonal piece, at least one of the two parallel sides being reinforced by a second cardboard wall; and

an envelope formed of cardboard and extending around the plurality of cells.

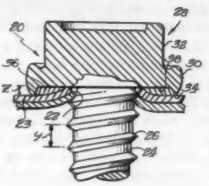
4,310,272

THREADED FASTENER AND STRUCTURAL JOINT ATTAINED THEREWITH

Roger K. Rich, Rural Retreat, and Charles B. Testerman, Wytheville, both of Va., assignors to Textron Inc., Providence, R.I.

Filed Jan. 18, 1980, Ser. No. 113,353
Int. Cl.³ F16B *39/28*
U.S. Cl. 411—185 **5 Claims**

1. A structural joint comprising, in combination, an externally threaded fastener member including a shank segment having a continuous external thread formed on a portion thereof to a predetermined pitch, and an enlarged head segment including a drive tool engaging portion kand a flange portion, and an apertured relatively thin workpiece structure having a thickness that is not substantially greater than said thread pitch engaged by said fastener member with said threaded shank disposed in said aperture and the thread formed thereon engaged with the underside of the periphery of said aperture to draw said workpiece into clamped engagement with said flange portion of the enlarged head segment, said flange portion being formed to a cup-shaped configuration and opening in a direction toward said threaded shank said cup-shaped flange portion defining a rim and a base surface, said base surface extending substantially radially, and said rim extending substantially axially and substantially parallel to said shank to provide a cylindrical configuration and said rim overlapping at least partially the continuous thread on said shank



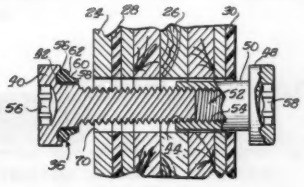
the depth of said cup-shaped configuration being shallow and limited to a pre-determined value not greater than approximately one-half the pitch of said thread on the shank segment, said thread engaged with the underside of the periphery of said aperture drawing the workpiece material into engagement with said rim, and said rim providing a rigid abutment which permits only the workpiece material about the edge of said aperture to be deformed and flared internally of said rim, the deformed workpiece edge material being flared upwardly by said continuous thread and forced into wedged engagement between said thread and said base surface, said wedged engagement limiting and preventing enlargement of said aperture to an extent which would permit said thread to become disengaged from the underside of the periphery of said aperture in said workpiece material.

4,310,273

FASTENER ASSEMBLY

Hail Kirrish, Rockford, Ill., assignor to Textron Inc., Providence, R.I.

Filed Apr. 30, 1979, Ser. No. 34,617
Int. Cl.³ F16B *35/04, 39/282*
U.S. Cl. 411—338 **3 Claims**



1. A structural joint, comprising, in combination, a fastener assembly, a section of composite panel, or the like, and a rigid metal frame section to which said composite panel is attached, wherein both said panel and frame section define a through bore, said fastener assembly being disposed in said bore in clamping engagement with said panel and frame section to define said structural joint therebetween, said fastener assembly comprising, a bolt member having a first enlarged rigid head portion at one end and an elongate shank portion, said shank including an externally threaded segment, and an internally threaded nut member having a second enlarged rigid

head portion, drive tool accommodating means on at least one of said bolt and nut members such that said enlarged head portions can be drawn into clamping engagement with said panel and frame sections, with the enlarged head portion on the one of said members to engage said frame section including annular axially facing groove means, and an annular non-conductive elastomeric gasket member carried on an elongate portion of said one member, said gasket member including a bulbous end portion partially disposed in said groove, said groove means including a pair of annular radiused portions and an annular axially facing wall portion disposed intermediate said radiused portions, said gasket bulbous end portion being disposed in said groove and being of greater volume than said groove means, and an axially extending annular lip portion at the opposite end thereof, said lip portion being of a frusto-conical configuration converging in a direction away from said bulbous end portion, and said lip portion having an initial outer diameter proximate the free end thereof that is less than the diameter of said frame section bore and a major outer diameter greater than said frame section bore, said lip portion and said bulbous end portion meeting to define generally radially disposed axially facing shoulder means axially intermediate said gasket member, such that upon initial clamping engagement, said free end of the gasket lip portion will freely enter said frame section bore, with said annular lip portion being forced into the space between said frame section bore and the elongate portion of said one member disposed in said bore, with said gasket shoulder means engaging against said frame section to promote deformation of said bulbous end portion, with said radiused surfaces and said axially facing wall portion of the groove means serving to force the remainder of the annular lip into the space between said frame section bore and said elongate portion of said one member disposed in said bore, and also directing the material of said bulbous end portion to be deformed and forced radially outward of the groove to extend at least to the periphery of said enlarged head portion of said one member, said gasket member thereby extending axially of said frame bore in surrounding relation to the portion of said one member disposed in said bore, and also extending radially to underlie the enlarged head portion of said one member, thus serving to insulate said one member from said frame section and prevent galvanic corrosion, while also serving to seal against the entrance of moisture through said frame section bore.

4,310,274

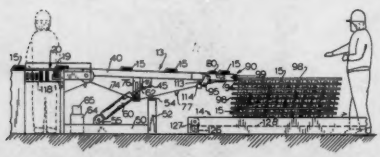
LUMBER STACKER AND METHOD

Kemper N. Moseley, 1007 Gloria Ave., Durham, N.C. 27701

Filed Sep. 27, 1979, Ser. No. 79,473

Int. Cl.³ B65G *57/18*

U.S. Cl. 414—42 **1 Claim**



1. A lumber handling and stacking apparatus comprising:

(a) a first conveyor formed by a fixed frame mounting a first set of parallel sprocket mounted drive chains with evenly spaced lugs thereon for engaging with upper runs of said chains and driving the trailing edge of individual boards received from a bulk supply of boards and for thereafter conveying with upper runs of said chains in a forward elevated portion of the conveyor evenly spaced apart boards along a fixed horizontal plane of travel and in a direction transverse to their longitudinal axes to a forward terminal edge portion for discharge;

(b) a second pivotal conveyor formed by a pivotal frame mounting a second set of parallel sprocket mounted drive chains with evenly spaced lugs thereon for engaging with upper runs of said second set of chains and driving the trailing edge of individual boards discharged by said first conveyor at the said forward terminal edge portion thereof for transfer to an overlapping rear receiving edge portion of said second conveyor and for thereafter conveying with upper runs of said second set of chains evenly spaced apart boards along a pivotal plane of travel and in a direction transverse to their longitudinal axes, said pivotal plane of travel of said second conveyor forming a continuation of said horizontal plane of travel of said first conveyor;

(c) a first conveyor drive shaft mounted on said first conveyor fixed frame and having drive sprockets operatively associated with both said first and second sets of drive chains and mounted on said drive shaft so as to laterally offset the chains of the first set from those of the second set, said drive shaft providing a fixed axis about which said second pivotal conveyor frame pivots and positioned between the said forward terminal edge portion of said first conveyor and the said rear receiving edge portion of said second conveyor to effect the overlapping of said forward terminal edge and rear receiving edge portions of said first and second conveyors;

(d) shaft means mounted on the said frame of said second pivotal conveyor near the discharge end thereof and mounting sprockets for carrying the said second set of chains of said second pivotal conveyor;

(e) remotely controllable means for raising and lowering said second pivotal conveyor for selectively positioning of the said pivotal plane thereof;

(f) a plurality of laterally spaced, releasable stick clamping means mounted on said second pivotal conveyor frame adjacent the forward discharge end thereof and corresponding in number to the desired number of stacking sticks used to separate each layer in the stack of lumber, each said stick clamping means having a fixed clamp surface opposite a movable clamp surface and being adapted when closed to releasably clamp at a position adjacent the discharge end of said second pivotal conveyor and clear of the said sprockets on said second conveyor shaft means a marginal end portion of one of the uppermost stacking sticks between said fixed and movable clamp surfaces and during the forming of a layer of lumber in said stack enabling the plurality of stacking sticks so clamped to be held stationary, horizontal and supported by previously stacked lumber and to serve as temporary stationary runners for supporting and guiding along a horizontal plane the individual boards discharged from said second pivotal conveyor and while said clamping means and sticks are maintained in relative angular relation appropriate to the position of said second pivotal conveyor for the layer of lumber being stacked, and each said releasable stick clamping means being adapted to have its movable clamp surface moved to open and release the plurality of sticks so clamped whereby said second pivotal conveyor may be moved upwardly to the level of the next layer to be formed;

(g) remotely controllable actuating means operatively associated with said stick clamping means and mounted on said second pivotal conveyor adjacent the discharge end thereof for opening and closing the movable clamp surfaces of said releasable stick clamping means in unison;

(h) a plurality of cams mounted on and driven by said second conveyor shaft means at the discharge end of said second pivotal conveyor and being adapted in synchronism with rotation of the sprockets on said shaft means and the movement of the lugs on said second set of chains to engage and push the trailing edge of each individual board forward away from the discharge end of said second pivotal conveyor and beyond the path of travel of said lugs on said second set of chains and in a horizontal plane of delivery; and

(i) a stacker base assembly providing means located and

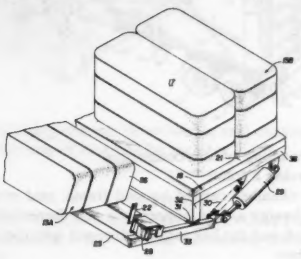
adapted to receive the successive layers of lumber during the forming of the lumber stack and to move the completed stack away from the discharge end of said second pivotal conveyor to allow the formation of another successive stack.

4,310,275

TILTING PLATFORM HAY BALE ACCUMULATOR

Darrel G. Hoelscher, R.R. 1, Bushton, Kans. 67427

Filed May 23, 1979, Ser. No. 41,709
Int. Cl.³ A01D *87/12*
U.S. Cl. 414—111 **4 Claims**



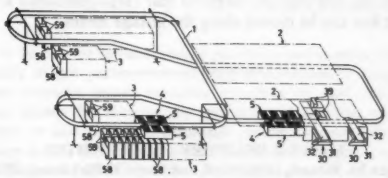
1. Hay baling apparatus comprising in combination, a mobile hay baler for producing bales with a rectangular cross section presenting wider and narrower sides and delivering them under baler power to move rearwardly as the baler moves forward on their wider sides at a platform level disposed above the ground, a wheeled mobile accumulator attached to and movable with the baler having a platform above its wheels disposed above ground at said platform level to receive from said baler a sequence of hay bales for temporary storage and discharge to the ground in ordered batches suitable for mechanized retrieval, said accumulator comprising, means disposing a tiltable portion of said platform into registration for receiving from the baler to move rearwardly on the platform under baler power into a row of a plurality of bales disposed rearwardly on the platform in a temporary longitudinal storage position thereon, power means located on the accumulator for moving said plurality of bales into an array of side-by-side rows, tilting means operable from the power means on the accumulator pivoting said tiltable portion of the platform thereby comprising loading means positioned adjacent one edge of said platform for receiving said bales delivered from said baler and rotating them one-quarter turn into place on the edge of a further part of the platform on their narrower sides thereby permitting rows of bales to accumulate side-by-side on the platform and requiring little driving force from the power means on the accumulator for loading the platform, a sensor mounted on said tiltable portion of the platform and movable therewith for actuating the tilting means when bales from the baler are in place, a platform discharge mechanism including platform pivot means operable from further power means disposed on the accumulator for tilting the platform to permit accumulated rows of bales to slide down the platform by force of gravity and rest on the ground behind the moving accumulator without a substantial drop to thereby reside in a batch relationship substantially identical with that on the platform, the accumulator bale handling means thereby consisting of two hydraulic cylinder actuated pivot means respectively for tilting one platform portion to accumulate bale rows and tilting another platform portion to discharge the bales, and a hydraulic control system for operating respectively the cylinders consisting of a pair of control valves, and valve positioning means for operating the control valves respectively in response to presence of said plurality of bales in said row and said plurality of bales in said array of rows wherein each cylinder has spring return means and each valve consists of a two position valve mechanism operable by the valve positioning means directing fluid under pressure selectively in one valve position to operate the cylinder against the spring return means from a power source of fluid under pressure and in the other valve position to direct fluid flow from the cylinder under spring pressure to a fluid storage tank.

4,310,276

MACHINE FOR SORTING OBJECTS OF VARIOUS DESTINATIONS PARTICULARLY SUITABLE FOR BULKY POSTAL CORRESPONDENCE

Guiseppe Castagnoli, Arenzano, Italy, assignor to Elettronica San Giorgio ELSAG S.p.A., Genova-Sestri, Italy

Filed Mar. 11, 1980, Ser. No. 129,462
Claims priority, application Italy, Apr. 19, 1979, 22015 A/79
Int. Cl.³ B07C *5/00*
U.S. Cl. 414—134 **10 Claims**



1. A machine for sorting objects of various destinations, particularly suitable for bulky postal correspondence, comprising a guide defining a path of varying configuration and passing through at least one loading station including at least one loading position which is fed in succession with the objects to be sorted, and at least one sorting station including at least one succession of collection containers for objects of different destination, and at least one succession of compartments for containing individual objects, said compartments being in packs of single units independently movable one in respect of the others along said guide in order to convey the objects from said loading station to said sorting station, said compartments being in the form of narrow pigeon holes having their surface of maximum size perpendicular to the direction of movement, said pigeon holes being provided with base walls which can be opened on command in order to discharge the objects into said collection containers, said loading station providing for means for conveying said objects to said compartments, said conveying means comprising coupling means which can be operated in order to momentarily connect said conveying means to said compartments.

4,310,277

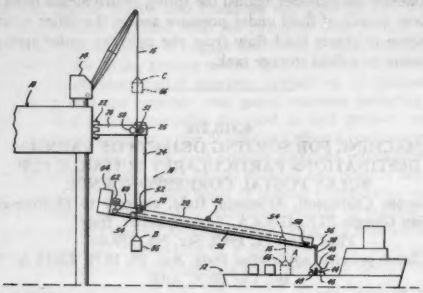
APPARATUS FOR TRANSFERRING CARGO BETWEEN RELATIVELY MOVABLE BODIES

James S. Robinson, 410 Flag Lake Dr., Lake Jackson, Tex. 77566

Filed Mar. 10, 1980, Ser. No. 128,445
Int. Cl.³ B65G *67/62*
U.S. Cl. 414—139 **13 Claims**

1. Apparatus for transferring cargo between first and second bodies which are movable relative to each other where a hoist for raising and lowering cargo through a hoist line is mounted on one of the bodies, the apparatus comprising linkage means for connecting the two bodies, pivot means for pivotally connecting the linkage means to the bodies and accommodating relative movement between the bodies, guide means located between the hoist line and one of the bodies for engaging and guiding the hoist line, and trolley means movable along at least a portion of the linkage means for engaging the hoist line on

the side opposite the guide means and moving the hoist line along the linkage between the guide means and the other body



while the line changes length so that cargo connected to the hoist line can be moved along the linkage means.

4,310,278

MOBILE DELIVERY FLOW UNIFIER

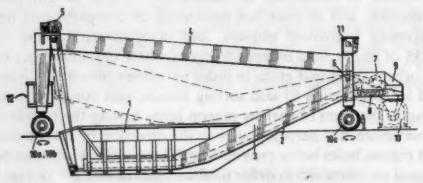
Jurgen M. Wenzel, Dusseldorf, and Horst V. Birkheuer, Hilden, both of Fed. Rep. of Germany, assignors to Mannesmann DeMag AG, Duisburg, Fed. Rep. of Germany

Filed Jan. 15, 1980, Ser. No. 112,398

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1979, 2906623

Int. Cl.³ B65G *41/00*

U.S. Cl. 414—332 **13 Claims**



1. A support for a mobile bulk delivery apparatus for equalizing delivery of bulk goods to a processing line, comprising

(a) an elongated delivery frame;

(b) an endless delivery belt mounted for movement on said delivery frame;

(c) a bulk goods receiving container mounted on one end of said delivery frame;

(d) said endless delivery belt extending into said receiving container;

(e) the top run of said endless belt forming the bottom surface of said receiving container;

(f) a support frame extending over and bridging said elongated delivery frame;

(g) said delivery frame being pivotally connected in a vertical plane to said support frame at a pivot point distally located from said receiving container;

(h) a plurality of mobile ground engaging power transport means on said support frame;

(i) at least one of said transport means positioned to pass on a side of said elongated delivery frame; and

(j) hoisting means extending between said elongated delivery frame and said bridging support frame, said hoisting means being located at the end of said delivery frame to which said receiving container is mounted.

4,310,279

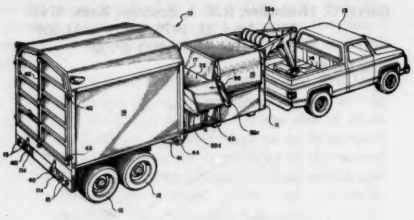
TRASH HANDLING SYSTEM

J. L. Johnston, 222 El Grandada Blvd., El Grandada, Calif. 94018

Filed Jan. 22, 1979, Ser. No. 5,071

Int. Cl.³ B65F *3/02*

U.S. Cl. 414—408 **17 Claims**



1. A trash handling system comprising

a vehicle having a frame;

a receiving chamber carried by said frame, said receiving chamber having a feed hopper at a top thereof through which trash and the like may be dropped into the receiving chamber;

a storage chamber carried by said frame at one end of said receiving chamber;

means forming an opening interconnecting the interior of the receiving chamber and the interior of the storage chamber;

a gate arranged to close the opening interconnecting the interior of the receiving chamber and the interior of the storage chamber;

means for moving the gate between its closed position and an open position; and

means carried by said frame for compressing trash and the like in the receiving chamber against the gate when said gate closes the opening and for moving compressed trash and the like from the receiving chamber to the storage chamber when the said gate is opened.

4,310,280

APPARATUS FOR DUMPING AND COLLECTING CORROSIVE SUBSTANCES FROM AUTOMOTIVE BATTERIES

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Division of Ser. No. 866,515, Jan. 3, 1978, Pat. No. 4,203,699, and a continuation of Ser. No. 669,216, Mar. 22, 1976, Pat. No. 4,081,093. This application Sep. 21, 1979, Ser. No. 77,777

The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.

Int. Cl.³ B65G *65/04*

U.S. Cl. 414—415 **8 Claims**

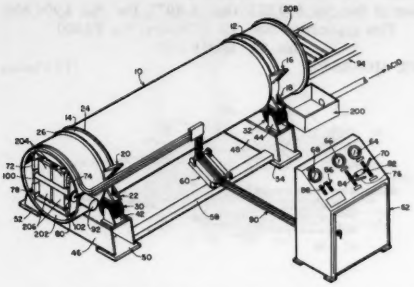
1. An apparatus for dumping acid-containing automobile batteries, said apparatus comprising:

(a) an inperforate substantially tubular member including along the longitudinal axis thereof;

(b) support means for supporting said tubular member and rotating said tubular member about its longitudinal axis through an arc of less than 360°; and

(c) at least two longitudinal, parallel spaced baffle members within said tubular member, said baffle members being in an acid-tight connection with the interior surface of said tubular member substantially along the length thereof and

forming at least one battery processing channel therebetween, whereby any acid dumped from a battery in said



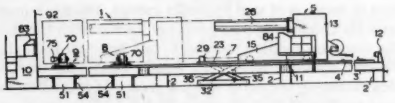
processing channel flows within said channel toward the lower end of said tubular member .

4,310,281

PIPE NESTING AND DENESTING APPARATUS

Hiroji Egashira, 6-24, 6 chome, Shinmachi, Hoya-city, Tokyo, Japan

Filed Jun. 30, 1980, Ser. No. 164,792
Claims priority, application Japan, Jul. 11, 1979, 54-86955
Int. Cl.[3] B65G 7/10; B66F 11/00
U.S. Cl. 414—433 7 Claims



1. A pipe nesting and denesting apparatus comprising:

a pair of rails which are extended linearly and fixedly secured to base frames;

a carriage having a supporting rod, the base of which is fixedly secured to said carriage in such a manner that said supporting rod is extended horizontally and forwardly, at a predetermined level, in the axial direction of said rails;

a receiving stand whose height can be adjusted, said receiving stand being disposed at predetermined position between said rails so that said receiving stand can receive and support a pipe in the axial direction of said supporting rod;

a pair of nesting stands which are positioned with a predetermined distance therebetween in the axial direction of said supporting rod and forwardly of said receiving stand,

each of said nesting stands having a stand plate whose height can be adjusted, a roller frame whose position can be adjusted in such a manner that said roller frame is slid perpendicularly to the axial direction of said supporting stand, said roller frame being provided on said stand plate, and a pair of rollers rotatably mounted on both end portions of said roller frame so as to support in the axial direction of said supporting rod a first pipe into which a second pipe is inserted or multiple pipes obtained by nesting pipes; and

an operating stand disposed forwardly of said nesting stands, said operating stand allowing the axis of said second pipe supported on said supporting rod to be in alignment with the axis of said first pipe through an operator's visual collimation,

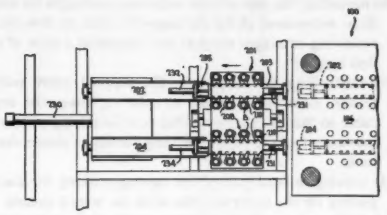
said operating stand including means for electrically controlling means adapted to operate said stand plates, roller frames and rollers of said nesting stands.

4,310,282

DELAY STRETCH AND BLOW MACHINE SYSTEM

Robert Spurr, West Hartford, and Robert J. Duga, Enfield, both of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Continuation-in-part of Ser. No. 805,918, Jun. 13, 1977, Pat. No. 4,140,464. This application Feb. 21, 1979, Ser. No. 13,417
Int. Cl.[3] B29D 23/03
U.S. Cl. 414—753 7 Claims



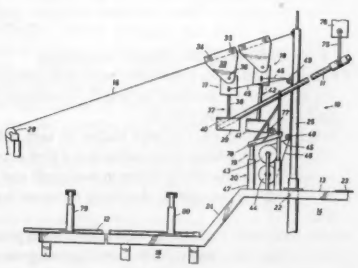
1. A device for simultaneously receiving and transferring a plurality of hot parisons comprising in combination support means; carriage means movably mounted on said support means; means for reciprocally moving said carriage means laterally to said support means; arm means mounted on said carriage means for lateral movement with said carriage means; a plurality of parison gripper means mounted on said arm means, each of said plurality of gripper means having a jaw set; actuating means for said jaw sets including a pair of actuating members, one jaw of each of said jaw sets mounted on one of a pair of said actuating members and the other jaw of said jaw sets mounted on the other of said pair of actuating members constructed and arranged with said arm means and actuating means, said actuating means for actuation of said actuating members being constructed and arranged with said actuating members to simultaneously open or close said jaw sets upon actuation of said actuating members.

4,310,283

METHOD FOR HANDLING PIPE

J. T. Teague, Longview, Tex., assignor to LeRoy LaSalle, Carthage, Tex.

Division of Ser. No. 57,640, Jan. 23, 1970, Pat. No. 4,082,193, and a continuation of Ser. No. 887,831, Mar. 17, 1978, abandoned. This application Apr. 3, 1978, Ser. No. 892,511
Int. Cl.[3] E21B 19/00
U.S. Cl. 414—786 15 Claims



1. A method for transferring pipe wherein the pipe is transferred between a pipe rack and the rig floor of a drilling rig elevated above the pipe rack by a support cable supporting a pair of pipe receiving carriages for longitudinal movement therealong and which pipe receiving carriages control the position of a pipe bottom supported thereon and wherein the support cable extends at one end to a means for controlling the

tension in the support cable and incorporating a control cable connected to one pipe receiving carriage and a winch means for selectively pulling the control cable comprising the steps of:

(a) anchoring the other end of the support cable positioned with part of the support cable disposed in space in overlying relationship to the pipe rack and part of the support cable extending upwardly at an angle to be disposed in close proximity to the rig floor of the drilling rig;

(b) mounting the pair of pipe receiving carriages for longitudinal movement along the support cable so that the pipe receiving carriages support and transport a pipe of specified length;

(c) controlling the tension in the support cable with the tension controlling means to raise or lower the support cable so that the support cable enables raising or lowering movement of the pipe receiving carriages above the pipe rack;

(d) moving at least one of the carriages along the cable by pulling on the control cable with the winch means;

(e) said carriage moving step selectively positioning one carriage through the control cable; and

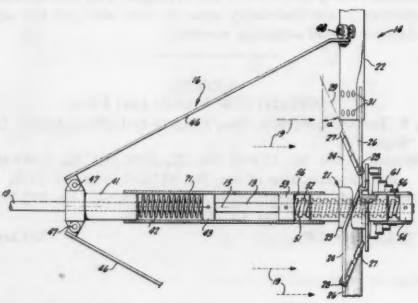
(f) temporarily supporting a pipe on at least one of the pipe receiving carriages by limiting lengthwise positioning of the pipe during raising or lowering movement of the pipe along the support cable.

4,310,284

AUTOMATICALLY CONTROLLED WIND PROPELLER AND TOWER SHADOW ELIMINATOR

Arthur J. Randolph, P.O. Box 1541, Santa Rosa, Calif. 95405

Filed Aug. 27, 1979, Ser. No. 69,800
Int. Cl.³ F03D *7/04*
U.S. Cl. 416—132 B **5 Claims**



1. A windmill propeller system comprising

a hub mounted upon a rotatable shaft and carrying a plurality of blades in extension outwardly therefrom for rotating said shaft by wind power,

a hinge mounting each of said blades on said hub with each hinge having a hinge axis inclined at a first acture angle to a plane perpendicularly through said shaft and at a second acute angle to an axis of the blade mounted by the hinge, and

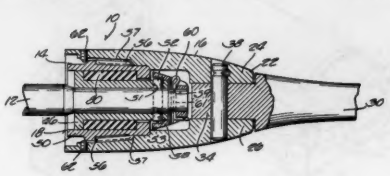
means resiliently restraining said blades from pivoting about said hinge axes away from wind blowing on said blades and including a collar linked to said blades and slidably disposed on said shaft for movement between a first pair of fixed stops on said shaft, means resiliently urging said collar away from said hub, mounting means mounting said hub for limited movement longitudinally of said shaft and spring means resiliently urging said hub along said shaft into the wind for limited pivoting of said blades on said hinges.

4,310,285

FOLDING PROPELLER WITH RUBBER HUB

Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 859,052, Dec. 9, 1977, Pat. No. 4,204,806.
This application Nov. 13, 1979, Ser. No. 93,400
Int. Cl.³ B63H *1/24*
U.S. Cl. 416—134 R **10 Claims**



1. A foldable propeller assembly adapted for connection to a drive shaft, said propeller assembly comprising a propeller carrier having an open end portion defining an axially extending mounting socket for receiving the drive shaft and including a forwardly located portion and rearwardly located portion of lesser size than said forwardly located portion so as to define therebetween a shoulder, said propeller carrier also including a hub end portion spaced from said open end portion, a pair of propeller blades pivotally mounted on said hub end portion for movement from a folded-together, collapsed position to a radially outwardly extending operative position in response to rotation of said propeller carrier and for movement from the operative position to the collapsed position in response to cessation of rotation of said propeller carrier, and drive means for drivingly connecting said propeller carrier with the drive shaft for common rotation therewith, said drive means including a sleeve member having an axially extending bore for rotatably receiving the drive shaft, a shear pin located in said rearward portion of said mounting socket and drivingly connecting said sleeve member and the drive shaft for common rotation, a drive member releaseably receivable in said forwardly located portion of said socket in engagement with said shoulder so as to limit inward receipt of said drive member into said socket and in rotary driving connection with said propeller carrier so as to drivingly connect said propeller carrier with said drive member for common rotation and so as to enable disconnection of said propeller carrier from said drive member without affecting the connection between said sleeve member and the drive shaft by said shear pin, and a resilient member interposed said drive member and said sleeve member for establishing driving connection between said sleeve member and said drive member and for absorbing torque forces transmitted between said propeller carrier and the drive shaft.

4,310,286

ROTOR ASSEMBLY HAVING A MULTISTAGE DISK

Gary P. Peters, Lebanon; Robert L. Rowley, Glastonbury, and Peter E. Voyer, Tolland, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

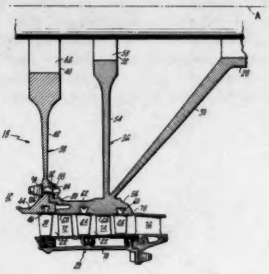
Filed May 17, 1979, Ser. No. 40,010
Int. Cl.³ F01D *5/06*
U.S. Cl. 416—198 A **8 Claims**

1. For a gas turbine engine having an axially extending flowpath for working medium gases, a rotor assembly of the type having a front end, a rear end and at least two rows of circumferentially spaced rotor blades extending outwardly from the rotor assembly across the flowpath, the improvement comprising:

a rotor shaft;

an endmost rotor disk having a bore, a web and a rim including a first slot at the rim which is adapted to receive a first row of rotor blades and a second slot at the rim which is adapted to receive a second row of rotor blades; and

a frustoconical member extending outwardly from said rotor shaft to the rim of said rotor disk thereby shielding the



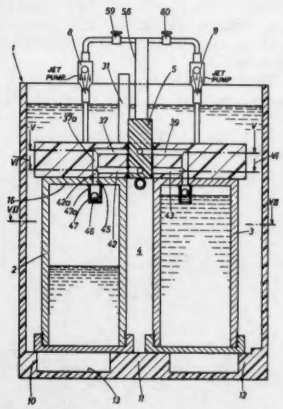
bore and the web of said rotor disk from the working medium gases of the engine flowpath.

4,310,287

METHOD AND APPARATUS FOR OPERATING A WATER-JET PUMP

Siegfried Heilenz, D-6300 Giessen-Kleinlinden 1, Fed. Rep. of Germany

Filed Nov. 16, 1979, Ser. No. 95,132
Int. Cl.³ F04F 5/44
U.S. Cl. 417—54 **24 Claims**



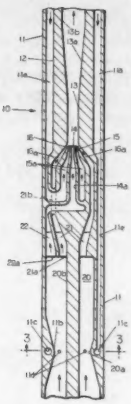
1. A method for the operation of a water-jet pump, in which the water which is needed for the operation of the pump is recirculated in a cycle, in which the improvement comprises pressurizing the water by means of compressed air at a substantially constant air pressure, the compressed air driving the water through the water-jet pump, and expanding the compressed air in a defined let-down space, wherein heat is withdrawn from the water, which heat is absorbed by the air during and after its expansion.

4,310,288

METHOD AND APPARATUS FOR IMPROVING EROSION RESISTANCE OF THE MIXING CHAMBER OF A JET PUMP

John W. Erickson, Huntington Beach, Calif., assignor to Kobe, Inc., Commerce, Calif.

Filed Mar. 23, 1979, Ser. No. 23,203
Int. Cl.³ F04F 5/26, 5/46
U.S. Cl. 417—54 **6 Claims**



1. A jet pump for pumping fluids containing abrasive particulate material comprising: a housing defining a generally cylindrical mixing chamber having fluid inlet means at one axial end thereof and pressurized fluid discharge means at the other axial end; said fluid inlet means comprising an axially central orifice, an annular, substantially axially directed jet producing orifice surrounding said central orifice, and an outer annular orifice surrounding said axially directed jet producing orifice; first conduit means connecting said central orifice to a source of particulate containing fluid to be pumped; second conduit means connecting said annular, axially directed jet-type orifice to a source of high pressure clean fluid to produce a high velocity axial flow of said clean fluid; third conduit means connecting said outermost annular orifice with a low pressure source of relatively clean fluid, whereby said high velocity axial flow of clean fluid exerts a concurrent eduction action on both said particulate containing fluid and said low pressure relatively clean fluid, and pressure is imparted to the particulate containing fluid by momentum transfer of the annular high velocity jet stream issuing from the annular, axially directed jet-type orifice while the relatively clean fluid issuing from the outermost annular orifice protects the wall of said mixing chamber from abrasive contacts by the particulate material in the fluid being pumped; a generally cylindrical separator chamber defined in said housing and having an inlet in communication with the source of particulate containing fluid to be pumped; an annular passage surrounding said separator chamber and connected thereto by a plurality of tangentially disposed nozzles; and fourth conduit means connecting with said second conduit means for directing a portion of said high pressure clean fluid to said annular passage, thereby rotating the particulate containing fluid entering said separator chamber to effect the centrifugal separation thereof into two streams, one containing most of the particulate material and the other being relatively clean, said third conduit means receiving the relatively clean fluid stream and said first conduit means receiving the particulate containing stream.

6. The method of protecting the mixing chamber of a jet pump from abrasive effects of a fluid containing particulate matter comprising the steps of: supplying a pressurized flow of clean fluid concurrently to an annular orifice at the inlet end of the mixing chamber and to tangentially disposed nozzles in a

separation chamber communicating with a source of particulate containing fluid, thereby centrifugally separating the particulate containing fluid into two streams, one containing most of the particulate materials and the other stream being relatively free of the particulate materials; directing the particulate containing stream into a nozzle located in the center of the annular orifice; and directing the particulate free stream into a second annular orifice concentrically surrounding the first mentioned annular orifice.

4,310,289

HYDRAULICALLY OPERATED STEERING SYSTEM WITH PRESSURE CONTROL

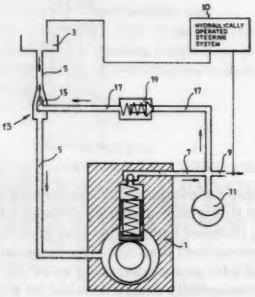
Johann Merz, Bopfingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Nov. 15, 1979, Ser. No. 94,543

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1978, 2852724

Int. Cl.³ F04B *23/10, 49/00*

U.S. Cl. 417—87 **4 Claims**



1. For use with a fluid operated system having a pump (1), an intake conduit (5) connected thereto conducting a controlled inflow of fluid, a pressure outlet (7) connected to the pump and a pressure limiting valve (19) conducting fluid from the pressure outlet to the intake conduit in response to a discharge pressure of the pump in excess of a predetermined limiting valve, the improvement residing in a discharge conduit (17) connecting the limiting valve to said pump outlet, and injector means (13–15) connecting said limiting valve to the intake conduit for directing a discharge jet of the fluid in a direction opposite to said inflow of the fluid to the pump within the intake conduit.

4,310,290

RADIAL PISTON PUMP

Jörg Dantlgraber, Lohr am Main; Dietmar Gössl, Gössenheim, and Horst Kramer, Lohr, all of Fed. Rep. of Germany, assignors to G. L. Rexroth GmbH, Lohr, Fed. Rep. of Germany

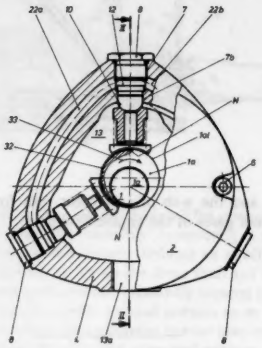
Filed Apr. 5, 1978, Ser. No. 894,018

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1977, 2716888

Int. Cl.³ F04B *1/14*

U.S. Cl. 417—273 **9 Claims**

1. A radial piston pump, comprising a housing bounding a suction chamber therein and having an axis, said housing being provided with a plurality of pressure ports spaced from one another in a circumferential direction of said housing, and with at least one suction port; a plurality of valve units spaced from one another in the circumferential direction of said housing, each of said valve units including a pressure valve element located in a respective one of said pressure ports and performing the functions of controlling flow of a working fluid, and a separate threaded sleeve-shaped closure member mounted in the same pressure port radially outwardly of said pressure valve element and performing only the function of closing the same pressure port from outside and passing a pressure medium therethrough, so that a pressure chamber is formed radially between the pressure valve element and the separate closure member inwardly of and communicating with the pressure port; means communicating said pressure chambers with each other, including a plurality of channels which extend only circumferentially in said housing and intersect the respective



pressure chambers formed between the respective pressure valve elements and the separate closure members; and a plurality of piston units spaced from one another in the circumferential direction of said housing and each having a piston and a cylindrical member connected therewith, each of said pressure valve elements sealingly abutting against a respective one of said cylindrical members of said piston units over an annular sealing surface which has a diameter smaller than a diameter of a respective one of said pressure ports in which said pressure valve element is located.

4,310,291

LIQUID FUEL PUMPING APPARATUS

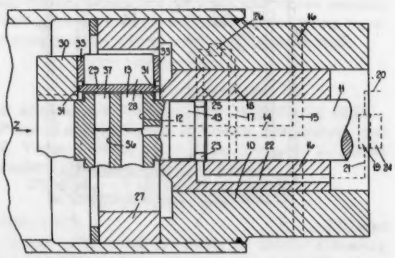
Alan C. Green, Reading, and Stephen D. Gregory, Kingsbury, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Jul. 9, 1979, Ser. No. 56,114

Claims priority, application United Kingdom, Aug. 3, 1978, 32075/78

Int. Cl.³ F02M *59/08*

U.S. Cl. 417—435 **5 Claims**



1. A liquid fuel pumping apparatus for supplying fuel to a compression ignition engine and of the kind comprising an injection pump including a reciprocal plunger contained within a bore and cam means for imparting inward movement to the plunger to effect fuel delivery through an outlet or a plurality of outlets in turn, a feed pump which draws fuel from a fuel inlet and supplies fuel to the injection pump during the

filling periods thereof, means for controlling the amount of fuel supplied to the bore during a filling period whereby the amount of fuel delivered to the engine is determined by said means, a cylinder forming part of the injection pump, a reciprocal piston within said cylinder, valve means responsive to the output pressure of the feed pump and arranged when the pressure is below a set value to connect said cylinder and said bore so that the plunger and piston together effect delivery of fuel to the engine, said valve means when the output pressure of the feed pump is above said set value disconnecting the cylinder from the bore so that the plunger alone effects delivery of fuel to the engine, the plunger and piston together acting to supply excess of fuel to the engine for the purpose of starting the engine, characterized in that said piston constitutes a valve at one extreme of its movement to allow air contained within the cylinder to be vented from the cylinder.

4,310,292

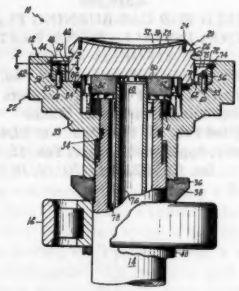
HIGH SPEED ROTARY ATOMIZATION MEANS FOR MAKING POWDERED METAL

Russell L. Carlson, North Palm Beach, and William H. Schaefer, Tampa, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 29, 1980, Ser. No. 220,544

Int. Cl.³ B01J *2/02*

U.S. Cl. 425—8 **7 Claims**



1. In a rotary atomization apparatus for receiving a stream of molten metal on a top surface for the production of solidified metal particles, said atomization apparatus comprising a drive shaft mounted for rotation, disk means disposed on the top of said drive shaft for rotation therewith, said disk means including a disk and a drive portion, said disk having a shallow, concave, upper surface having a cylindrical periphery, said drive portion being fixedly secured to said drive shaft, the improvement comprising:

said drive portion including an upwardly extending cylindrical portion surrounding said disk, drive means associated with said drive portion and fixed relative thereto including radially inwardly extending drive elements engaging said disk at a plurality of circumferentially spaced locations for providing a drive connection between said drive portion and said disk.

4,310,293

APPARATUS FOR MOULDING CONCRETE

Richard C. Eggleton, 39 Geneva Crescent, Wagga Wagga, New South Wales, Australia

Filed Mar. 31, 1980, Ser. No. 135,891

Int. Cl.³ B28B *1/04, 3/24*

U.S. Cl. 425—62 **4 Claims**

1. A machine for compacting and moulding concrete mix or other plastic materials comprising, in combination:

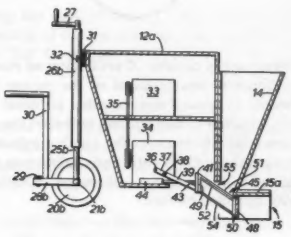
(a) a body structure;

(b) a tunnel shaped moulding member having a top and two sides and open at its bottom, said moulding member being attached to said body section;

(c) an opening in the top of said moulding member adjacent to said body section;

(d) a hopper adapted to carry concrete mix or other plastic materials, and feed the mix or materials to said opening, said hopper being attached to said body structure;

(e) a substantially vertical ram plate having a shape which corresponds to the cross-sectional shape of said moulding member, said ram plate being located within said moulding member and being adapted to move reciprocally from a first position adjacent to said body to a second position wholly within said moulding member, while maintaining said substantially vertical position, and wherein said ram plate has at least one slot or hole formed therein, through which steel reinforcing rod or wire can be fed to the region within said moulding;



(f) means to cause said reciprocal movement of said ram plate, said means being carried by said body structure, and comprising a motor driving a reduction box having an output shaft connected by linkages to a piston arrangement, said piston arrangement being connected to said ram plate and including a horizontally moving piston wherein the connection between said piston arrangement and said ram plate includes a plate or at least one rod, the plane or longitudinal direction of which is at an acute angle relative to the horizontal; and

(g) means supporting said body structure, said supporting means comprising at least one wheel which is steerable, adjustable in height and adapted to move in a direction substantially opposite from and in response to said compaction; whereby said machine is sequentially and automatically repositioned by said compacting for further moulding and compacting.

4,310,294

APPARATUS FOR CORONA FREE PINNING OF EXTRUDED POLYMER FILM

Wilfried F. De Geest, Berchem; Paul A. Verkinderen, Edegem, and Felix F. De Smedt, Wilrijk, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Division of Ser. No. 677,816, Apr. 16, 1976, Pat. No. 4,166,089, which is a continuation of Ser. No. 492,184, Jul. 26, 1974, abandoned, which is a continuation of Ser. No. 347,667, Mar. 30, 1973, abandoned, which is a continuation of Ser. No. 88,555, Nov. 12, 1970, abandoned. This application Aug. 27, 1979, Ser. No. 69,922

Claims priority, application United Kingdom, Nov. 13, 1969, 55708/69

Int. Cl.³ B29D *7/02*; H05B *7/00*

U.S. Cl. 425—174.8 E **5 Claims**

1. An apparatus for producing polymer films comprising:

(a) an extrusion die having an electrically grounded orifice for extruding a continuous film,

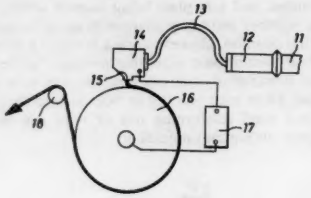
(b) means for supplying molten thermoplastic, film-forming, polymeric material to said die to extrude therethrough a continuous film of molten polymer,

(c) at least one electrically conductive rotatable cooling

cylinder receiving upon its peripheral surface the advancing polymer film while still molten and supporting the film by rotating to advance therewith until the film is at least substantially solidified,

(d) means for removing the solidified film from such cooling cylinder surface,

(e) means for electrically insulating said cooling cylinder from ground, and



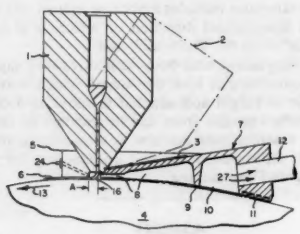
(f) a power supply capable of producing an electrical potential difference, one terminal of the power supply being connected to ground and the other terminal being electrically connected to said cooling cylinder, the magnitude of the potential difference of the cooling cylinder surface as maintained by said power supply relative to ground being sufficient to increase the adherence of said film to said cooling cylinder surface.

4,310,295

DEVICE FOR UNIFORM WEB PINNING

David E. Heyer, Circleville, Ohio, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 28, 1981, Ser. No. 229,159
Int. Cl.³ B29D 7/02
U.S. Cl. 425—224 **5 Claims**



4. A vacuum pinning device wherein extruded web material is uniformly pinned to a quench roll, with vacuum sources of said device comprising posterior and anterior vacuum sources and, said device further comprising:

(a) a vacuum shoe housing at least two interacting vacuum zones, primary and secondary;

said primary zone located proximate the surface of the web at the line of contact between the web and the quench roll;

said primary zone having a crevice that which runs under a baffle fitted proximate the quench roll and joining the primary and secondary zones;

said secondary zone positioned distal the line of contact between the web and the quench roll relative to the primary zone;

said secondary zone having its outer perimeter surrounded by a proximity seal with the quench roll;

said secondary zone having a vacuum source connected thereon said vacuum source being the posterior vacuum source; and

(b) an edge seal vacuum chamber, extending from and interconnected to the secondary zone, with one side open to a molten web edge as said web contacts the quench roll;

said open side extending on both sides of the contact line of the web with the quench roll whereby the vacuum chamber encompasses a portion of the web on both sides of said contact line;

said edge seal vacuum chamber having a vacuum source downstream from an extention of the die lip opening projected onto the quench roll relative to the movement of the roll, such vacuum source being the anterior vacuum source;

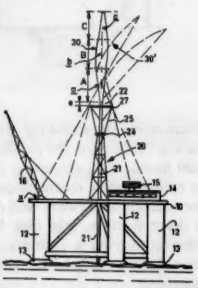
whereby the primary zone is quiescent relative to the secondary zone because the primary zone is isolated by the baffle from turbulence caused by the posterior vacuum source, and isolated from the edge leak air by the ancillary vacuum chamber wherein said leak air is drawn past the edges of the web into the ancillary vacuum chamber substantially perpendicular to the movement of the casting drum.

4,310,296

HEAT-SHIELD FOR GAS-BURNING FLARE IN OIL PRODUCTION INSTALLATIONS, PARTICULARLY PLATFORMS AT SEA

Gerard Chaudot, Andresy; Rene Ombret, Pau, and Paul Zimmerman, Nanterre, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed Feb. 15, 1979, Ser. No. 12,432
Claims priority, application France, Feb. 15, 1978, 78 04225
Int. Cl.³ F23D 13/20, 13/36
U.S. Cl. 431—5 **5 Claims**



1. A process of protecting at least a selected portion of the area of an oil production installation from the heat radiation emitted by the generally upwardly extending flame produced at the outlet of the nozzle of a gas burning flare mounted on the top end of a generally vertical flare pipe extending from a platform supporting said installation, said selected area portion being defined about the geometrical axis of said flare pipe, comprising the steps of: /

ejecting said gas to be burned through said nozzle at / a flow velocity higher than Mach 0.2 and /

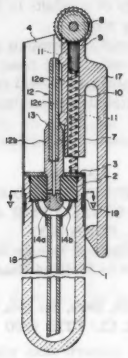
shielding said selected area portion from said heat / radiation by providing, at a distance of 1 to 3 meters below / said nozzle outlet, substantially horizontal annular heat shielding means made of stainless steel sheet and means having an outer periphery and an inner periphery which delimits a central circular aperture the diameter of which equals about2 to 6 times the diameter of said flare pipe, said inner periphery concentrically surrounding said flare pipe.

4,310,297

GAS LIGHTER

Seiichi Kitabayashi, No. 919-12, Oaza-koshikiya, Ageo-shi, Saitama, Japan

Filed Jan. 2, 1980, Ser. No. 109,153
Int. Cl.³ F23Q *1/04*
U.S. Cl. 431—254 **8 Claims**



1. A gas lighter comprising:
a fuel injection pipe member having a main passage and at least one radial lateral passage communicating to the main passage, a fuel tank for liquefied fuel gas, a valve member made of resilient, flexible material and sealingly surrounding said fuel injection pipe member for selectively preventing the fuel gas from flowing therethrough and allowing the fuel gas to flow therethrough when said valve member is suitably deformed, a spark generating mechanism for generating a spark, having a tubular body, a flint, a spring and a knurled wheel, said spring disposed in a hollow cylindrical space of said tubular body for urging said flint toward the knurled wheel, a windbreak for substantially enclosing the fuel injection pipe member and retaining said spark generating mechanism therein so that said mechanism is movable downwardly against said spring, guide means for assisting the up and down movement of said spark generating mechanism, and valve actuating means for deforming said valve member, including a camming surface for tilting said fuel injection member.

4,310,298

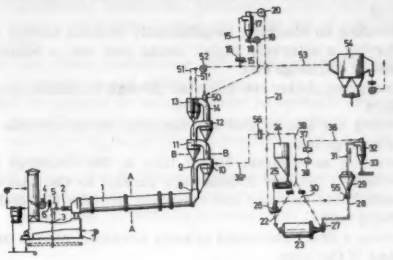
METHOD AND DEVICE FOR PRODUCING COAL DUST

Andris Abelitis, Rösrath, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Oct. 24, 1979, Ser. No. 88,089
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1978, 2850895
Int. Cl.³ F27B *15/00*
U.S. Cl. 432—14 **9 Claims**

1. An improved method for drying and pulverizing coal in a pulverizing apparatus to produce a supply of coal dust for firing a related installation having a preheating stage and a calcining stage with a transitional region therebetween, the related installation supplies heated, essentially inert gas to the pulverizing apparatus, the improvement steps comprising:

supplying at least a part of the coal dust bearing exhaust gas to the related installation, and



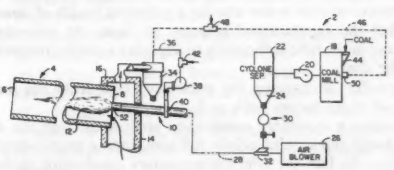
introducting the part of the coal dust bearing exhaust gas into a section of the transition region at a temperature in a range of 720° C. to 850° C.

4,310,299

METHOD FOR FIRING A ROTARY KILN WITH PULVERIZED SOLID FUEL

Chester S. Binasik, Palo Alto, and Louis D. Siegert, Burlingame, both of Calif., assignors to Coen Company, Inc., Burlingame, Calif.

Filed May 5, 1980, Ser. No. 146,810
Int. Cl.³ F27B *15/00*; F23D *1/00*
U.S. Cl. 432—14 **7 Claims**



1. A method for heating a rotary kiln having an open end from which product being treated in the kiln is discharged by injecting through the end into the kiln and combusting in the kiln pulverized coal including volatiles at a rate so that a desired temperature is maintained within the kiln, the method comprising the steps of:
providing a burner including a flame tube extending into the kiln;
generating a first, pressurized primary airflow comprising no more than about 2% of the theoretical amount of air needed to combust the coal in the kiln;
entraining in the first primary airflow the pulverized coal at said rate to form a pulverized coal flow;
directing the pulverized coal flow into the tube;
adding a second, supplemental primary airflow having a temperature of at least about 600° F. to the pulverized coal flow in the tube to form an air-pulverized coal stream;
regulating the flow rate of the second primary airflow so that the first and second airflows comprise no more than about 15% of the theoretical amount of air needed to combust the coal in the kiln;
retaining the stream in the tube for a sufficient length of time to evaporate volatiles present in the coal while the stream is in the tube;
thereafter discharging the stream including evaporated volatiles into the kiln;
igniting the stream;
generating a secondary combustion airstream having a temperature of at least about 800° F.; and
adding a sufficient amount of secondary air to the stream

injected into the kiln to effect a substantially complete combustion of the pulverized coal in the kiln.

4. A method for producing clinker for the subsequent conversion thereof into the cement, the method comprising the steps of:

providing an elongate, longitudinally inclined tubular kiln having a relatively higher intake end and a relatively lower discharge end;

introducing clinker raw materials through the intake into the kiln;

rotating the kiln so that the materials travel towards the discharge end;

providing an elongate burner tube at the discharge end which is oriented substantially parallel to the kiln, and which has an inner end extending into the kiln and an outer end;

flowing a first, pressurized primary airstream into the outer end of the tube;

forming a second flow of supplemental primary air having a temperature of at least about 600° F.;

combining the first and second airflows in the vicinity of the tube and directing the combined airflow through the tube into the kiln;

entraining pulverized coal in the first airflow at a rate selected so that the complete combustion of the coal in the kiln heats the materials in the kiln to a desired temperature;

limiting the flow rate of the first airflow so that the second airflow provides a majority of the combined air flowing through the tube and further so that the combined air comprises not more than about 15% of the theoretical amount of air required to combust the pulverized coal in the kiln;

retaining the combined first and second airflows and the entrained coal in the tube for a sufficient length of time so that the supplemental primary air heats the pulverized coal in the tube sufficiently to vaporize volatiles present in the coal;

thereafter discharging the pulverized coal from the inner end of the burner tube; and

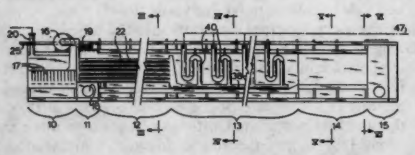
directing a secondary combustion airflow through the discharge end in substantially full surrounding relationship to the tube into the kiln, the secondary combustion airflow having an amount of air sufficient to fully combust the pulverized coal discharged from the inner tube end into the kiln and further having a temperature substantially in excess of the temperature of the second airflow.

4,310,300

FURNACE FOR PORCELAIN ENAMELING

Peter B. Mackenzie, Fonthill, Canada, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Aug. 28, 1980, Ser. No. 182,467
Int. Cl.³ F26B 9/12; F27B 9/02, 9/00
U.S. Cl. 432—18 **10 Claims**



1. A porcelain enameling furnace assembly comprising:

means defining a drying zone for incoming ware,

means including a pair of spaced, vertical banks of conduits defining a radiator pre-heating zone between which said ware passes following said drying zone,

means defining a heating zone for said ware following said pre-heating zone,

means defining a cooling zone following said heating zone,

conveyor means for conveying an enamel coated ware successively through said drying, pre-heating, heating and cooling zones, said heating zone including a serpentine tube radiant heater,

burner means introducing hot combustion gases into said serpentine tube heater to heat the same to a temperature sufficient to fuse the enamel onto the ware by radiation,

means for directing the combustion gases from said heating zone into said banks of conduits to heat the ware in said radiator pre-heating zone,

means for directing said combustion gases from said pre-heating zone into said drying zone for convective heat transfer across the surfaces of said ware, and

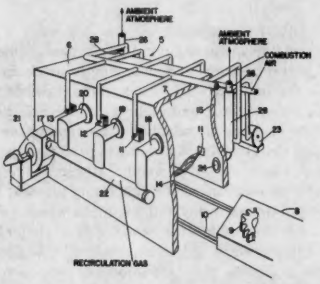
means for exhausting relatively low temperature gases from said drying zone.

4,310,301

COMBINATION BURNER AND EXHAUST GAS RECIRCULATION SYSTEM FOR A CARBOTTOM FURNACE

Richard R. Mayers, Delta, and Dennis A. Chojnacki, Toledo, both of Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 19, 1980, Ser. No. 208,166
Int. Cl.³ F27B 9/00
U.S. Cl. 432—121 **7 Claims**



1. A furnace, comprising:

(a) a housing having a pair of opposing, vertically disposed sidewalls which extend between a top and bottom of the furnace and which define a chamber that has a longitudinal axis and is sealable from the ambient atmosphere;

(b) means for moving an article to be heat treated, into and out of the chamber;

(c) a plurality of high velocity or high momentum-type stoichiometric burners strategically mounted on the furnace to circulate hot gaseous products of combustion, under pressure and at a high velocity, into the chamber to provide within the chamber, at least a portion of the desired amount of heated gas to properly heat treat articles placed in the chamber;

(d) means mounting the burners in at least one horizontally aligned row in at least one of the sidewalls vertically above the longitudinal axis of the chamber adjacent the top of the furnace for directing hot gaseous products of combustion in a generally horizontally direction into the chamber;

(e) means for removing gas from the chamber and recirculating at least a portion of such gas directly into the chamber without reheating it, to maintain the desired heated atmosphere within the chamber, especially during turndown of the burners, said means including at least one horizontally aligned row of gas inlets in an opposing sidewall diagonally opposite the row of burners and vertically below the longitudinal axis of the chamber adjacent the bottom of the furnace for directing said recirculated portion of gas back into the chamber in a generally horizontal direction,

the burners and inlets being positioned so that gas therefrom generally swirls in the chamber about the longitudinal axis thereof; and

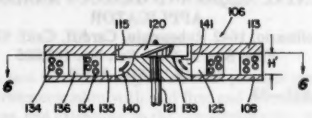
(f) means for exhausting gas from the chamber vertically below the longitudinal axis thereof adjacent the bottom of the furnace.

4,310,302

BATCH COIL ANNEALING FURNACE BASEPLATE

Arvind C. Thekdi, Sylvania; Robert W. Buchwald, Toledo, both of Ohio, and Robert A. Schmall, Temperance, Mich., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Mar. 28, 1980, Ser. No. 135,214
Int. Cl.³ F27B *5/04, 11/00*; C21D *1/12*
U.S. Cl. 432—205 **4 Claims**



1. An apparatus for heat treating a work item that has a longitudinally extending axial passageway, such as a coil of metal, comprising:

(a) a vertically elongated space for receiving at least one work item which is positioned therein such that the axial passageway thereof is vertically oriented;

(b) a generally horizontally disposed baseplate on which the work unit is supported in the space, the baseplate having a center opening in substantial alignment with the axial passageway of the work unit when properly positioned on the baseplate;

(c) an axial flow fan mounted adjacent the baseplate for directing gas vertically upwardly through the opening of the baseplate and axial passageway of the work unit, the fan being rotatable about an axis which is generally normal to the plane of the baseplate;

(d) a fairing adjacent the fan for directing gas through an annular opening formed between the fairing and center opening of the baseplate, the fairing having an annular curved surface which is concentric with the rotational axis of the fan and generally curved inwardly towards the rotational axis of the fan for directing gas vertically upwardly through the annular opening;

(e) at least one annular turning vane disposed adjacent the annular opening and around the fairing in spaced relation from the curved surface thereof for directing gas through a portion of the annular opening farthest from the fairing, the vane having an annular curved surface that is also generally curved inwardly toward the rotational axis of the fan; and

(f) a plurality of straighteners radially oriented about the fairing adjacent the concave surface thereof to prevent the swirling of gas about the rotational axis of the fan as the gas passes through the annular opening into the axial passageway of the work unit.

4,310,303

PLUG-IN RECUPERATOR AND METHOD

David W. Collier, Cannock, England, assignor to W. B. Combustion, Inc., Hales Corners, Wis.

Filed Jul. 11, 1980, Ser. No. 168,810
Int. Cl.³ F27B *5/14*
U.S. Cl. 432—209 **3 Claims**

1. A radiant tube heater combustion system for a furnace, comprising:

A U-shaped radiant heating tube disposed within said furnace, and having a pair of legs,

a burner disposed within one leg of said heating tube, the other leg of said heating tube being joined to exhaust means for receiving exhaust gases from said burner,

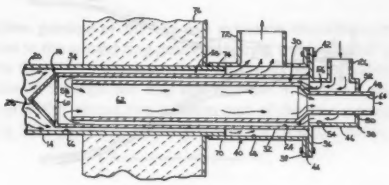
fuel means for feeding fuel to said burner,

a recuperator operatively positioned within said exhaust means, and extending into said other leg of said heating tube,

air inlet means connected to said recuperator and detachably connected to said exhaust means,

said recuperator including an outer recuperator tube spaced inwardly of and cooperating with said exhaust means and said other leg for defining an annular exhaust gas chamber therebetween;

said recuperator further including an inner recuperator tube spaced inwardly of and cooperating with said outer recuperator tube for defining an annular air chamber communicating with said air inlet means, and said inner recuperator tube defining an inner air flow passageway for directing heated air through air outlet means towards said burner,



said outer recuperator tube including a baffle at one end for directing heated air from said annular air chamber to said inner air flow passageway,

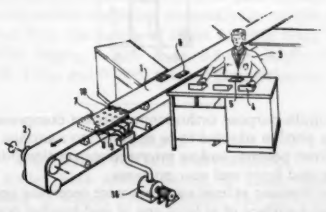
said annular exhaust gas chamber and said annular air chamber being positioned in counter-flow arrangement with each other so that air flowing through said annular air chamber travels in a direction generally opposite the flow of exhaust gases through said annular exhaust chamber, whereby air entering said air inlet means is heated in said recuperator by said exhaust gases in said annular exhaust chamber before being directed through said air outlet means to said burner.

4,310,304

INSTALLATION FOR ASSEMBLING ELECTRONIC COMPONENTS

Andre Decrulle, Paris, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jul. 10, 1980, Ser. No. 168,320
Claims priority, application France, Jul. 31, 1979, 79 19646
Int. Cl.³ F24J *3/00*; F27B *9/22*
U.S. Cl. 432—230 **5 Claims**



1. An installation for assembling electronic components on a support and for soldering the components to the support by re-melting a layer of metal previously deposited on the support, the installation comprising an imperforate endless conveyor belt on which the component-bearing supports are placed, and at least one hot plate having a plane surface over which the belt slides, wherein the improvement comprises a

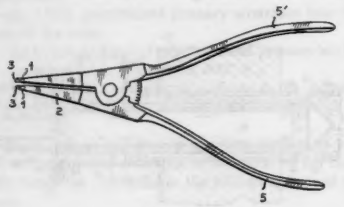
plurality of ducts within the body of the hot plate, each duct having one end opening onto said plane surface, and a vacuum pump connected to the other end of each duct.

4,310,305

MECHANICAL DEVICE FOR HOLDING ELASTIC ARTICLES

Jacob Frajdenrajch, 9 Rue Croix Baragon, 13000 Toulouse, France

Filed Nov. 21, 1978, Ser. No. 962,642
Claims priority, application France, Nov. 25, 1977, 77 35616
Int. Cl.³ A61C *3/14*
U.S. Cl. 433—4 **14 Claims**



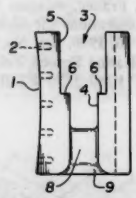
2. A mechanical device for holding elastic articles, comprising a pair of circlips pliers having a set of primary jaws and a set of handles, said primary jaws being adapted to open when said handles are squeezed together, said pliers further comprising a set of secondary jaws, each of said secondary jars being arranged on a corresponding primary jaw, said secondary jaws being spaced from said primary jaw so as to hold said elastic articles and wherein said secondary jaws are biased against said primary jaws by means of biasing means.

4,310,306

MULTI-PURPOSE ORTHODONTIC BRACKET

Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214

Continuation of Ser. No. 959,671, Nov. 13, 1978, Pat. No. 4,242,085. This application May 12, 1980, Ser. No. 149,251
The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—14 **61 Claims**



1. A multi-purpose orthodontic bracket comprising:

a rear portion adapted to be mounted to a surface of a tooth, a front portion, and an intermediate portion interconnecting said front and rear portions;

means forming at least one arch wire receiving opening in at least a surface of at least one of said bracket portions, said arch wire receiving opening having a predetermined width and extending between said front and rear portions in a buccal-lingual direction;

support means on at least one of said front and rear portions and extending toward the other of said front and rear portions for a distance which is substantially less than the width of said arch wire receiving opening, said support means including at least a plurality of support areas distributed along at least a portion of the width of the bracket on at least one side of said arch wire receiving opening for supporting an arch wire thereon, whereby when an arch wire having width less than the difference between the width of the arch wire receiving opening and the extent of said support is inserted in the bracket it does not supportingly engage said support means, and when an arch wire having a width greater than said difference is inserted in the bracket it is supportingly engaged on said support means; and

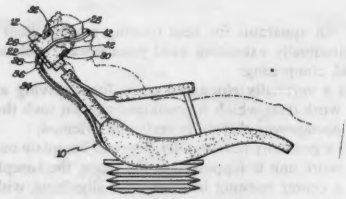
means defining a retaining pin receiving slot in said bracket extending substantially perpendicularly to the arch wire receiving opening.

4,310,307

DENTAL AUDIO AND GASEOUS ANALGESIA APPLICATOR

Nolan Bellisario, 1642 Rubenstein, Cardiff, Calif. 92007

Filed Sep. 2, 1980, Ser. No. 183,005
Int. Cl.³ A61G *15/00*
U.S. Cl. 433—33 **9 Claims**



1. A combination audio and gaseous analgesia applicator for simultaneously supplying music from a sound source and analgesic gas from a gas source to a dental patient lying in a dental chair having a headrest, said applicator comprising:

(a) a headpiece mountable on said headrest;

(b) a pair of forwardly projecting side pieces extending from said headpiece and spaced to lie adjacent a head resting on said headrest, and including a speaker in each of said headpieces connected to said sound source;

(c) a nose piece shaped and dimensioned to substantially cover the nose only of a patient lying in said chair while exposing the mouth for access by the dentist; and

(d) means mounting at least one gas tube, which tube connects said gas source and said nose piece, to at least one of said side pieces such that said tube is supported near said nose piece to carry the substantial drag of said tube which would otherwise be supported by said nose piece.

4,310,308

DUAL-SIDE ASPIRATOR FOR DENTAL DAM

Hal J. Oien, Portland, Oreg., assignor to Jordco, Inc., Portland, Oreg.

Continuation of Ser. No. 44,244, May 31, 1979, abandoned. This application Aug. 7, 1980, Ser. No. 176,051
Int. Cl.³ A61C *17/04*
U.S. Cl. 433—91 **4 Claims**

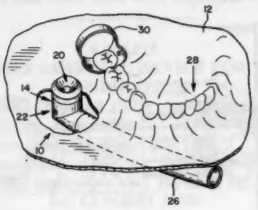
1. Aspirating apparatus in combination with a dental dam of the type including opposed surfaces, one of which forms a working-side surface, and the other of which forms a non-working-side surface, and a generally circular aperture with a defined relaxed-state diameter extending between and opening to such surfaces, said apparatus, in operative condition with respect to such a dam, comprising

an aspirating head including one portion having a generally cylindrical configuration formed with a reduced-diameter, outwardly facing, substantially circular groove with a base diameter exceeding the relaxed-state diameter of the aperture in the dam sealingly and removably receiving the

circumferential margin of the aperture, with such margin, as so received, in a tensed and stretched state,

means in said head defining a first aspirating passage exposed on the working-side surface of the dam,

means in said head defining a second aspirating passage exposed on the nonworking-side surface of the dam, and



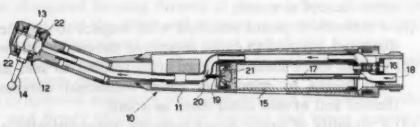
means in said head defining an exhaust passage arranged in fluid communication with said first and second aspirating passages, and extending on the nonworking-side surface of the dam.

4,310,309

DENTAL BUR DRILL

Osvaldo Favonio, Ornago, Italy, assignor to FARO Fabbrica Apparecchiature Razionali Odontoiatriche S.p.A., Ornago, Italy

Filed May 6, 1980, Ser. No. 147,307
Claims priority, application Italy, May 9, 1979, 22506 A/79
Int. Cl.³ A61C *1/08*
U.S. Cl. 433—104 **4 Claims**



1. A dental bur drill comprising:

a tubular handpiece traversed by at least one conduit;

a rotor having a bearing-mounted shaft mounted at an extreme and portion of said handpiece wherein said conduit delivers compressed air to said rotor and to said bearing-mounted rotating shaft;

a bur fitted to said bearing-mounted shaft;

a lube-oil container mounted in said handpiece;

an injection nozzle protruding from said container and extending within said conduit wherein said conduit communicates with said container at a point upstream of said nozzle; and

a needle which traverses said injection nozzle.

4,310,310

LOCKING ASSEMBLY FOR DENTAL HANDPIECE

Ronald L. Bailey, St. Charles, Mo., assignor to Young Dental Mfg. Co., Hazelwood, Mo.

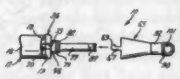
Filed Sep. 8, 1980, Ser. No. 184,751
Int. Cl.³ A61C *1/08*
U.S. Cl. 433—126 **15 Claims**

1. A connection assembly for a dental handpiece comprising:

(a) a first sleeve having a first end and a second end, and having an exterior surface with an exterior notch formed in said exterior surface, the notch extending longitudinally relative to the first sleeve, the notch having an edge that opens the notch towards the first end of the first sleeve;

(b) a second sleeve having a first end and a second end with a locking extension projecting longitudinally from the second end of the second sleeve, the extension having a lug sized to be received within the said notch; and

(c) a locking ring with means for being rotatably mounted to the first sleeve to rotate from a first locking position to a second unlocking position, the ring having an exterior surface with a longitudinal slot formed therein sized to



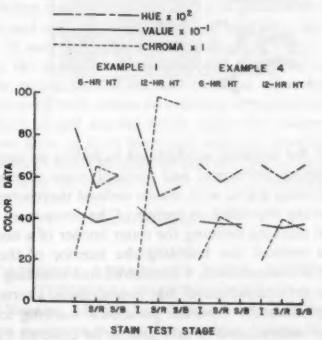
allow passage of the lug and extension therethrough so that in the second ring position the ring slot is aligned with the first sleeve notch to allow the lug to be longitudinally moved through the ring slot into the first sleeve notch, and in the second ring position part of the ring surrounding the slot blocks removal of the lug from the notch.

4,310,311

STAIN-RESISTANT MICA COMPOSITIONS FOR DENTAL PRODUCTS AND PROCESSES OR THE LIKE

David G. Grossman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 8, 1980, Ser. No. 195,248
Int. Cl.³ A61C *13/00*; C03C *3/22*
U.S. Cl. 433—199 **2 Claims**



1. A stain-resistant tetrasilicic fluormica glass-ceramic article having a composition consisting essentially, in weight percent as calculated from the batch, of about 45–70% SiO_2, 8–20% MgO, 8–15% MgF_2, 5–20% K_2O, 0.5–2% Al_2O_3, 0.5–7% ZrO_2, 0–7% TiO_2, and 0–10% total of glass colorants.

4,310,312

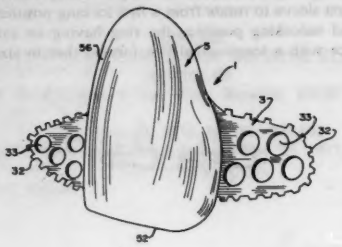
ANTERIOR TOOTH PROSTHESIS

Ronald P. Keller, 5431 Alwood Forest, St. Louis, Mo. 63128, and William G. Keller, 2107 Briargate La., Kirkwood, Mo. 63122

Filed Jun. 10, 1980, Ser. No. 158,244
Int. Cl.³ A61C *0/00*
U.S. Cl. 433—204 **3 Claims**

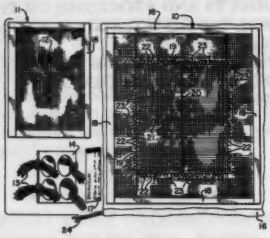
1. An anterior tooth prosthesis comprising a one-piece metal framework having laterally extending wings, a central saddle with a broad concave surface defining a mouth at an edge away from the gum adjacent the framework when the prosthe-

sis is in place, and a peg integral with said surface and projecting toward said mouth, and a plastic pontic having a peg-



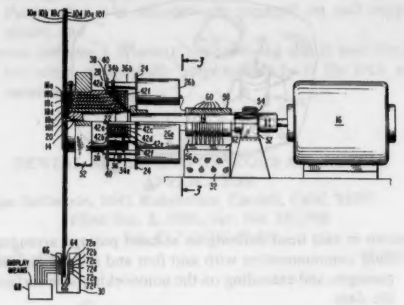
receiving mortise in which said peg is seated and secured and a bite edge projecting beyond said mouth of said saddle.

4,310,313
KIT FOR NEEDLEPOINT WORK
Marie K. Brundige, Bliss Rd., Box 90, Sugar Groove, Ill. 60554
Filed Jul. 7, 1980, Ser. No. 166,314
Int. Cl.³ G09B *19/20*
U.S. Cl. 434—95 **8 Claims**



1. A kit for working needlepoint including an open weave canvas having horizontal and vertical rows of intersecting strands forming a grid with spaces defined therebetween, said canvas having imprinted on certain of the component strands a perimetric marking defining the outer border of a needlepoint pattern, a vertical line bisecting the interior of the defined perimeter in two sections, a horizontal line bisecting the interior of the defined perimeter into two sections, a series of lines extending outwardly from the perimetric marking to identify and locate intersections in said grid to be covered by needlepoint stitches; a graph type chart sheet including horizontal and vertical grid lines corresponding to the horizontal and vertical rows of said intersecting strands of said canvas, a perimetric marking and horizontal and vertical bisecting lines corresponding to the perimetric marking and the horizontal and vertical bisecting lines on said canvas, a series of numerical designations adjacent to and outwardly of the perimetric marking to identify and locate grid intersections on the canvas to be covered by needlepoint stitches, a plurality of colored markings located at the intersections of the horizontal and vertical lines, each marking designating the color of a needlepoint stitch to be used in covering the corresponding intersection of said canvas whereby the colored markings define a pattern inside said perimetric marking comprising the needlepoint design formed on the canvas by covering the designated intersections with stitches of the colors designated by the colored markings; a plurality of colored yarns corresponding in color and amount to said colored markings on said graph type chart for use in working the needlepoint design defined on said chart; and one or more needlepoint needles.

4,310,314
REFLECTED COLOR SIMULATOR
Philip R. Worn, Belle Mead; Ralph A. Stanziola, Bridgewater, both of N.J., and Donald R. Hall, South Yarmouth, Mass., assignors to Applied Color Systems, Inc., Princeton, N.J.
Filed Jun. 23, 1980, Ser. No. 162,338
Int. Cl.³ G09B *19/00*
U.S. Cl. 434—101 **20 Claims**



1. A reflected color simulator comprising:

(a) a plurality of color discs positioned adjacent to one another and each including a plurality of individual sections interleaved with said sections of adjacent of said color discs, said color discs being mounted for rotational movement thereof as a single unit, said color discs being also mounted for rotational movement with respect to one another to vary the amount of color exposed from said sections of each of said color discs to control the reflected color simulated therefrom responsive to rotational movement thereof as a unit;

(b) a main shaft means attached with respect to said color discs and adapted to cause rotational movement thereof;

(c) a main drive means secured with respect to said main shaft means to selectively cause rotational movement thereof and of said color discs as a unit;

(d) a plurality of drum means oriented concentrically with respect to one another around said main shaft means, each of said drum means being rotatably movable selectively with respect to one another with respect to said main shaft means, each of said drum means being associated with and being secured at one end thereof each to a different one of said color discs to selectively cause rotational movement of said color discs with respect to one another responsive to rotational movement of the associated of said drum means with respect to one another;

(e) a mounting plate secured with respect to said main shaft means to be selectively rotatable therewith;

(f) a plurality of secondary drive means fixedly secured with respect to said mounting plate to be rotatable therewith, each of said secondary drive means being associated with one of said drum means and being operatively secured thereto to selectively cause rotation thereof with respect to the other of said drum means responsive to actuation of the associated one of said secondary drive means;

(g) a gearing means operatively connecting each of said secondary drive means individually with respect to the associated one of said drum means to cause rotation of the one of said color discs associated therewith with respect to the other of said color discs responsive to actuation of the associated one of said secondary drive means to vary the amount of color exposed from said sections of each of said color discs to control the reflected color simulated therefrom responsive to rotational movement of the plurality of said color discs as a unit;

(h) a sensor means operably secured with respect to movement of said color discs to sense and display the amount of

color exposed from said sections of each of said color discs; and

(i) a control means operably connected with respect to said secondary drive means to control actuation thereof and to continuously control the reflected color simulated from said interleaved sections of said color discs while rotating as a unit by controlling the rotational movement of said sections of said color discs with respect to one another.

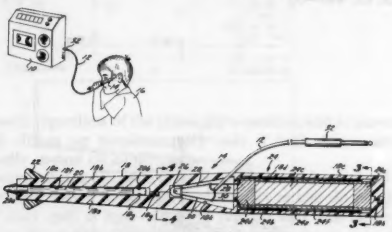
4,310,315
TACTILE LEARNING DEVICE FOR THE HANDICAPPED

Daniel G. Frank, Thousand Oaks; Jack Schaefer, Brea, and Richard L. Zweig, Huntington Beach, all of Calif., assignors to Therapeople, Inc., Whittier, Calif.

Continuation-in-part of Ser. No. 935,128, Aug. 21, 1978, abandoned. This application May 10, 1979, Ser. No. 37,809

Int. Cl.³ G09B *21/00*

U.S. Cl. 434—114 **4 Claims**



1. A learning device for use with a record playing mechanism comprising in combination:

an elongated housing formed at one end with a cavity and adapted at the other end to receive a writing instrument;

a writing instrument at said other end of said housing;

an audio transducer in the cavity at said one end of said housing, comprising:

a cylindrical stationary electrical winding positioned within and firmly secured to said housing and being wound in reverse directions on each end of a bobbin;

an unsecured elongate cylindrical permanent magnet member movable relative to said housing and positioned coaxially within said cylindrical winding;

a retaining member of rubber foam fitted firmly into opposite ends of said bobbin between each end of said magnetic member and said housing to maintain the unsecured magnetic member in a null, centralized position within said winding;

means for connecting said audio transducer with a reeord playing mechanism to cause said housing to be vibrated in accordance with the audio signal from said mechanism.

4,310,316
DIET CONTROL APPARATUS

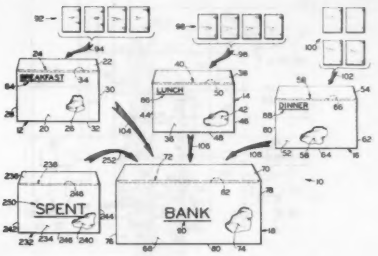
Patricia L. Thomann, 10393 Diamond Park Rd., Interlochen, Mich. 49643

Continuation of Ser. No. 856,401, Dec. 1, 1977, abandoned. This application Oct. 9, 1979, Ser. No. 82,701

Int. Cl.³ G09B *19/00*

U.S. Cl. 434—127 **19 Claims**

1. Diet control apparatus for use by a dieter in following a diet, comprising a plurality of food token means, container means for receiving said food token means therein, and food chart means, said food chart means comprising a list of specific items of foods, said list of specific items of foods being divided into at least first and second generically designated catagories of foods with each of said first and second catagories comprising a selected plurality of said specific items of foods, each of said specific items of food being identified by a commonly accepted name therefor along with a respective physically measurable quantitative unit thereof, said plurality of food token means comprising at least a plurality of first food token means and a plurality of second food token means, said plurality of first food token means carrying first code means, said first code means functioning to designate a particular meal of the day to which said plurality of first food token means pertain, said plurality of second food token means carrying second code means, said second code means functioning to designate an other meal of the day to which said plurality of second food token means pertain, third code means carried by said plurality of first token means, said third code means functioning to designate to which of said first and second catagories respective ones of said plurality of first food token means pertain, fourth code means carried by said plurality of second food token means, said fourth code means functioning to designate



to which of said first and second catagories respective ones of said plurality of second food token means pertain, fifth code means carried by said plurality of first token means, said fifth code means functioning to respectively designate on each of said first token means the number of said quantitative units of food from said selected plurality of said specific items of foods in either of said first and second catagories which may be chosen by the dieter as comprising said particular meal, and sixth code means carried by said plurality of second token means, said sixth code means functioning to respectively designate on each of said second token means the number of said quantitative units of food from said selected plurality of said specific items of foods in either of said first and second catagories which may be chosen by the dieter as comprising said other meal.

4,310,317
EDUCATIONAL APPARATUS WITH AUTOMATIC TERMINAL IDENTIFICATION

Shigenori Nomura, Mitaka, and Tetsuzo Kano, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 20, 1979, Ser. No. 77,282

Claims priority, application Japan, Sep. 27, 1978, 53-117847; Sep. 27, 1978, 53-131631

Int. Cl.³ G09B *5/04*

U.S. Cl. 434—319 **9 Claims**

1. An educational apparatus comprising:

a plurality of terminal control means each including

information signal input means,

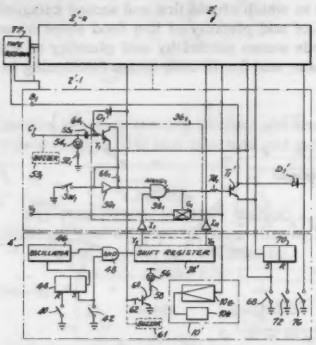
information signal transmitting means for receiving an information signal from the respective input means, each said information signal transmitting means including gate means having a controllable input and being adapted to pass the respective information signal to monitoring means, a logic level device having at least one input and which supplies an output signal to said controllable input of said respective gate means for controlling the passage of said respective information signal to said monitoring means, and a semiconductor device having an input supplied with a respective call signal and an output circuit adapted to supply an output signal to said respective logic level device for actuating said gate means to pass the

respective information signal to said monitoring means, and

call signal input means operative to provide said call signal by which the respective transmitting means is conditioned to be made operative for transmitting the information signal received from the respective input means; and

master control means including

indicating means for indicating when a call signal is provided by said call signal input means of any of said terminal control means,



monitoring means as aforementioned for monitoring said information signal from any one of said terminal control means, and

incoming call switch means actuable to cause operation of the transmitting means of the one of said terminal control means which has had its call signal input means operated to provide said call signal, whereby to pass the information signal through the operated transmitting means to said monitoring means.

4,310,318

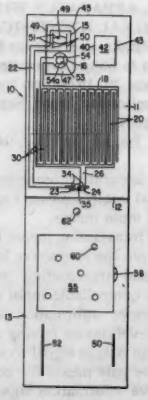
ELECTRONIC GAME

Albert W. D. Carlson, Roosevelt Island, N.Y., assignor to Rivercross Learning Corp., Roosevelt Island, N.Y.

Filed Sep. 17, 1980, Ser. No. 188,076

Int. Cl.³ G09B *7/00*

U.S. Cl. 434—339 **11 Claims**



1. An electronic game comprising:

a piece of material,

a pattern of electrically conductive ink is laid down on one side of said piece, said pattern having two combs of lines with interfitting teeth,

a pair of battery contact areas, a first line connecting one of the combs to one of the battery contact areas and a second line with a break connecting the other comb to the other battery contact area,

a response device electrically connected to the second line across the break,

said piece being cut to permit the portion having the battery terminal contact areas to be bent upwardly and said piece being formed with a slot through which the upwardly bent portion extends when the piece is folded.

4,310,319

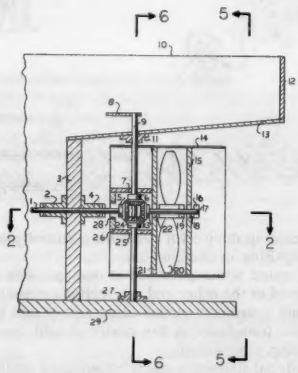
STEERABLE PROPELLER

John J. Fuller, 32 Hawley Rd., Scituate, Mass. 02066

Continuation of Ser. No. 31,852, Apr. 20, 1979, abandoned. This application Jan. 12, 1981, Ser. No. 224,101

Int. Cl.³ B63H *1/04*

U.S. Cl. 440—51 **1 Claim**



1. Steerable propulsion means for a marine vessel including a substantially vertical pivotal rudder shaft whose axis materially intersects the common substantially horizontal plane of an engine propeller shaft with beveled driv gear, and of an output shaft with beveled driven gear and propeller assembly; said vertical pivotal rudder shaft providing bearing support surfaces for a matched pair of beveled idler gears; said beveled idler gears meshed with said beveled drive gear of said engine propeller shaft and said beveled driven gear of said output shaft with propeller assembly; said beveled idler gears equidistantly spaced and diametrically opposed about center line of said common horizontal plane of said engine propeller shaft and said output shaft with propeller assembly; said beveled idler gears providing transmission means of divided engine power torque from said beveled drive gear of said engine propeller shaft to said driven beveled gear of said output shaft with propeller assembly.

4,310,320

ELECTRICAL CONTROL FOR TRIM/TILT OF DUAL OUTBOARD OR STERN DRIVES

Robert J. Pitchford, 131 6th St., Fond du Lac, Wis. 54935

Filed Nov. 13, 1979, Ser. No. 93,179

Int. Cl.³ B63H *5/08*

U.S. Cl. 440—61 **11 Claims**

1. In combination:

a pair of drives mounted side-by-side on a watercraft, each drive being vertically movable in a trim range and in a tilt range;

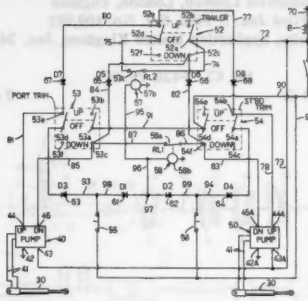
mechanical means connected to said drives and permitting

independent vertical movement of said drives within said trim range but preventing full independent vertical movement of said drives when either of said drives is outside of said trim range;

and control means for simultaneously moving both drives within said tilt range and for independently moving each drive within said trim range including

first means operable to move both drives down simultaneously regardless of the initial drive position and to move both drives up simultaneously only if both drives are initially in said tilt range;

and second means operable to move both drives down simultaneously only if both drives are initially in said tilt range and only until at least one drive reaches said trim range, and to move either drive individually up or down only if both drives are initially in said trim range and only until the drive being moved reaches said tilt range.



4,310,321

CONTROLLABLE DRIVE FOR THE AUXILIARY AGGREGATES OF INTERNAL COMBUSTION ENGINES, ESPECIALLY OF MOTOR VEHICLE INTERNAL COMBUSTION ENGINES

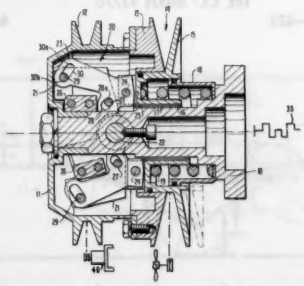
Wolfgang Peter, and Hans Hanke, both of Stuttgart, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jul. 14, 1978, Ser. No. 924,720

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732279

Int. Cl.³ F16H *55/52*

U.S. Cl. 474—14 **20 Claims**



1. An adjustable drive for auxiliary aggregates of internal combustion engines, in which at least some auxiliary aggregates are operable to be driven from the crankshaft of the internal combustion engine by way of a V-belt drive means automatically regulatable under centrifugal force interaction essentially in such a manner that at smaller and increasing crankshaft rotational speeds a transmission with a speed-up and progressively increasing output speeds results whereas at larger and increasing crankshaft rotational speeds a transmission with a speed-reduction and progressively decreasing output speeds results, characterized in that the regulating range of the V-belt drive means is subdivided into two partial load ranges, and in that a substantially constant transmission ratio lies between said two partial load ranges.

4,310,322

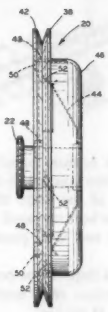
VARIABLE SPEED CLUTCH DRIVE

James P. Beck, Elgin, Ill., assignor to Dana Corporation, Toledo, Ohio

Filed Aug. 1, 1979, Ser. No. 62,670

Int. Cl.³ F16H *55/52*

U.S. Cl. 474—19 **5 Claims**



1. A pulley assembly comprising:

(a) a first disc fixed to a hub, a plurality of circularly disposed radially arcuate slots contained in said disc,

(b) a second disc moveable on said hub, coaxially mateable with said first disc and defining therewith a pulley sheave, said second disc further comprising a plurality of cams rigidly affixed thereto, each cam being disposed for sliding contact with an edge of one of said slots, and

(c) a spring for biasing said discs together, a spring housing bearing against said spring, said spring housing rigidly connected to said second disc via connection means extending through said slots of said first disc.

4,310,323

METHOD OF MANUFACTURE OF H-DIVIDER CONTAINERS

Lenard E. Moen, 7914 Michigan Ave., Whittier, Calif. 90602

Division of Ser. No. 910,198, May 30, 1978, Pat. No. 4,220,076. This application Jun. 9, 1980, Ser. No. 157,375

Int. Cl.³ B31B *7/26*

U.S. Cl. 493—92 **8 Claims**

1. A method of forming an H-divider container from a preformed flat H-divider blank and a preformed flat body blank,

the flat H-blank, comprising a paperboard sheet having a layer sandwiched between a pair of liners, having a pair of divider panels joined together along a preformed hinge line,

the hinge line comprising a score length leaving the top liner intact at least in part,

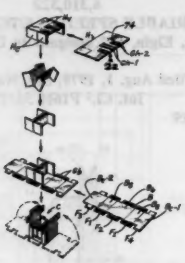
the flat H-blank further having each divider panel transversely flanked by an integral pair of foldable end wall panels,

the flat body blank comprising a substantially rectangular bottom panel joined, along a longitudinally spaced apart pair of parallel transverse fold lines, to an opposite pair of side panels, each of the side panels having a transversely opposite pair of foldable marginal flaps,

said method comprising the steps of:

folding the end wall panels of the flat H-blank substantially 90° towards that side of the H-blank having the bottom liner, while maintaining the divider panels in a common plane;

while maintaining the end wall panels in said substantially 90° folded condition, erecting the H-divider by folding the divider panels along the hinge line out of said common plane and into mutual contact of the top liners of the divider panels;



moving the body blank bottom panel into mutual contact with lower edges of the erected H-divider;

folding the side panels of the body blank substantially 90° upward relative to the bottom panel and into contact with vertical edges of the end wall panels of the erected H-divider;

and folding the marginal flaps of the body blank through 90° into contact with vertical edge portions of the end wall panels of the erected H-divider.

4,310,324

METHOD AND APPARATUS FOR THE MANUFACTURE OF FUSECORD

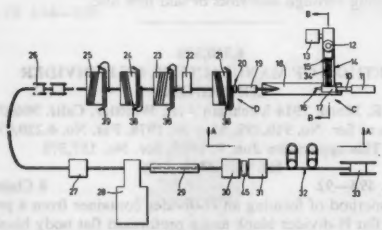
Robert M. Aitken, Stevenston, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 7, 1980, Ser. No. 109,904

Claims priority, application United Kingdom, Jan. 24, 1979, 02492/79

Int. Cl.³ F42C *19/02*

U.S. Cl. 86—1 R **19 Claims**



1. A method for the production of explosive fusecord which comprises continuously advancing a carrier tape in a horizontal linear path partially convoluting said tape to form a longitudinal open trough portion extending over a feed zone of said path, continuously feeding a stream of powdered explosive material into said trough portion at a rate controlled to provide only the exact amount required for the formation of the desired explosive core, said stream being elongated and extending longitudinally over a portion of the feed zone of greater length than the diameter of the core to be formed and having uniform distribution of the powdered explosive material along the longitudinal extent of said portion, further convoluting said tape in a zone subsequent to said feed zone to form a closed tube surrounding the same amount of explosive material and conveying the thus-produced core of explosive material and subsequently applying reinforcing materials around the said closed tube.

4,310,325

METHOD AND APPARATUS FOR THE MANUFACTURE OF FUSECORD

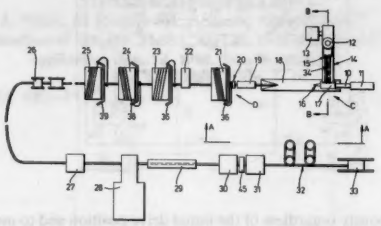
Robert M. Aitken, Stevenston, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 7, 1980, Ser. No. 109,902

Claims priority, application United Kingdom, Jan. 24, 1979, 02492/79

Int. Cl.³ F42C *19/02*

U.S. Cl. 86—1 R **7 Claims**



1. A method of manufacturing explosive fusecord comprising continuously advancing and convoluting a carrier tape into hollow tubular form, feeding a stream of explosive material into the tubular carrier tape to form an explosive core encased by the carrier tube and subsequently applying reinforcing materials around said carrier tube, said carrier tape being convoluted by drawing through shaping guide means under tension by draw means located downstream of the guide means, the passage of the carrier tape through the guide means being assisted by pulling an auxiliary transport belt through the guide means, said transport belt being in frictional contact with said carrier tape and moving at a speed substantially the same as the carrier tape so as to allow some slippage between the tape and the belt to ensure that the tape is maintained under tension in the guide means by said draw means.

4,310,326

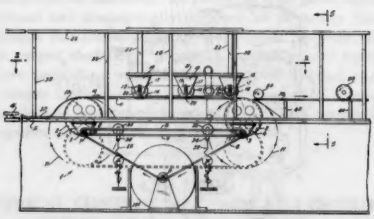
APPARATUS FOR FOLDING PAPER

Joseph V. Bellanca, R.D. 2, Muncy, Pa. 17756

Filed Aug. 23, 1979, Ser. No. 69,511

Int. Cl.³ B65H *45/16*

U.S. Cl. 493—423 **6 Claims**



1. An apparatus for folding a sheet of paper comprising a table surface for receiving a flat sheet of paper, means for moving said sheet of paper across said table surface, an opening in said table, a first paper restraining means spaced above said table surface a distance sufficient to permit the passage of said sheet between it and said table surface and positioned at each side of said table opening, second paper restraining means spaced above said table a distance equal to the length of a fold

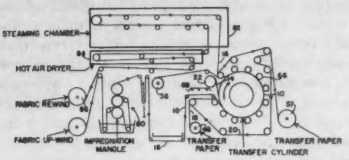
in said sheet of paper positioned at the forward end of and in alignment with the center of said table opening, a sheet folding mechanism comprising a closed loop flexible member extending about a pair of spaced apart pulleys each of which is eccentrically mounted, means driving said pulleys whereby the upper reach of the flexible member rises and falls while remaining parallel to the surface of the table, rotatable sheet ejecting means positioned above said sheet folding mechanism to contact said folded sheet of paper when the flexible member reaches its uppermost movement to drive the folded portion of said sheet onto said second paper restraining means.

4,310,327

WET TRANSFER PRINTING

Malcolm L. Winterbottom, Hayfield, and Donald W. H. Burtonshaw, Stockport, both of England, assignors to Transprints (U.K.) Limited, Manchester, England

Filed Oct. 22, 1979, Ser. No. 87,032
Int. Cl.[3] D06P *3/14*
U.S. Cl. 8—467 5 Claims



1. In a process for wet transfer printing a wool or wool rich fabric which comprises impregnating said fabric with an impregnating liquor and bringing a transfer print paper and the fabric into close contact, applying pressure and heat to transfer the dye from the paper to the fabric and fix the dye, the improvement which comprises introducing into the fabric as part of the wet transfer printing process, chlorine or a chlorine donor before transferring the dye from the paper to the fabric.

4,310,328

PROCESS FOR LIMING PELTS OF ANIMAL HIDES AND SKINS

Rolf Monsheimer, Darmstadt-Eberstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Feb. 19, 1980, Ser. No. 122,041
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911401
Int. Cl.[3] C14C *1/06*
U.S. Cl. 8—94.16 6 Claims

1. A method for liming animal skins and hides which comprises treating said skins and hides in a bath of an aqueous alkaline liming liquor comprising from 0.02 to 1 percent, by weight of the skins and hides, of a protective colloid which is a water soluble, alkali stable, high molecular weight polymethacrylate polymer, together with a hydrotropic agent.

4,310,329

AQUEOUS COMPOSITIONS FOR DARKENING KERATINOUS MATERIALS

David O. Holland, Dorking, England, assignor to Combe Incorporated, White Plains, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,476
Int. Cl.[3] D06P *3/14, 3/30*
U.S. Cl. 8—404 13 Claims

1. Aqueous composition for darkening keratinous material comprising a mixture of a solution of a salt of thiosulphuric acid, with a solution of a complex of bismuth with an aminopolyacetic acid, in the presence of a water-soluble amine, and of a di- or poly-hydroxy humectant.

4,310,330

METHOD FOR THE MANUFACTURE OF A COLORED NONFOGGING ARTICLE

Masaaki Funaki, Toyonaka; Motoaki Yoshida, Nishinomiya; Haruo Inatomi, Amagasaki; Ryozo Kuriyama, Ibaraki, and Taizo Oshima, Tondabayashi, all of Japan, assignors to Nippon Sheet Glass Co., Ltd. and Sumitomo Chemical Company, Limited, both of Osaka, Japan

Filed Jun. 18, 1980, Ser. No. 160,549
Claims priority, application Japan, Jun. 21, 1979, 54-77525
Int. Cl.[3] D06P *3/04, 3/58, 3/02, 3/00*
U.S. Cl. 8—506 20 Claims

1. A method for the manufacture of a colored nonfogging article, which comprises bringing a nonfogging substrate containing a surfactant into contact with a dyeing solution containing a surfactant, a solvent and a coloring material, said surfactant being contained in the dyeing solution in an amount within the range of 20 to 100% by weight based on the total amount of the surfactant and the solvent.

4,310,331

PROCESS FOR THE PREPARATION OF THE DYESTUFF DIRECT YELLOW 11 IN THE FORM OF CONCENTRATED STABLE SOLUTIONS, THE SOLUTIONS OBTAINED AND THEIR APPLICATIONS

Aime J. Arsac, Condrieu, and Pierre Frank, Saint Clair du Rhone, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Feb. 23, 1981, Ser. No. 237,566
Claims priority, application France, Mar. 21, 1980, 80 06319
Int. Cl.[3] C07C *105/00;* C09B *56/04, 67/02, 67/26*
U.S. Cl. 8—527 13 Claims

1. A process for the preparation of the dyestuff Direct Yellow 11, directly in the form of stable concentrated solutions, which comprises reacting caustic soda in aqueous solution with a solution containing 4-nitro-toluene-2-sulfonic acid, one or more alkanolamines and one or more alcohols containing an etheroxide function or a second alcohol function, at a temperature of 40° to 90° C., then neutralizing the caustic soda with sulfuric acid and separating the sodium sulfate thus formed by filtration.

4,310,332

OXIDATION OF SULFUR DYES

Philip B. Curzons, Altrincham, England, assignor to Interox Chemicals Limited, London, England

Filed Jan. 16, 1981, Ser. No. 225,521
Claims priority, application United Kingdom, Feb. 7, 1980, 04164/80
Int. Cl.[3] D06P *1/30*
U.S. Cl. 8—652 12 Claims

1. A process for the oxidation of sulphur dyes in reduced form, impregnated in or on a natural or regenerated cellulose fibre, comprising a first step of contacting the impregnated fibre with a dilute aqueous solution of hydrogen peroxide in order to effect at least partial oxidation of the sulphur dye and thereafter in a second step contacting the fibre containing a residual amount of the aqueous hydrogen peroxide solution with a solution of a transition metal activator for hydrogen peroxide.

4,310,333

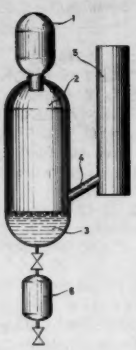
PROCESS AND PLANT FOR THE GASIFICATION OF SOLID FUELS VIA PARTIAL OXIDATION

Volkmar Schmidt, Oberhausen; Bernhard Lieder, Bottrop; Heinrich Scheve, Oberhausen, and Hans Dohren, Krefeld, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Continuation of Ser. No. 876,446, Feb. 9, 1978, abandoned. This application Mar. 17, 1980, Ser. No. 130,043
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1977, 2705558
Int. Cl.[3] C10J *3/68*
U.S. Cl. 48—77 9 Claims

9. Apparatus for the gasification of a solid fuel consisting essentially of a high pressure reactor disposed vertically over a radiation chamber which is cylindrical or conical, widens by 10 to 15 degrees towards the bottom, is made in a finned wall construction with a relation of height to diameter of ≦6:1 and comprises cooling surfaces, a jet centrally placed in said radiation chamber for introducing synthesis gas and combustion residues from said high pressure reactor into said radiation chamber at a flow rate of 1–30 m/sec; said radiation chamber having means for cooling inner surfaces thereof, said radiation

chamber having at the bottom thereof a water-containing bath, said radiation chamber connected to a conduit connecting means connecting said radiation chamber with a convection chamber, said apparatus further comprising a lock below the upper surface of said bath, which lock is in a conduit from said



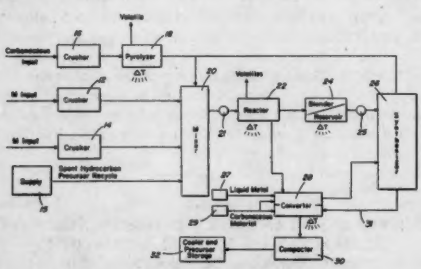
water bath whereby combustion residues are solidified upon contact with said water bath to form a solidified residue and said solidified residue contained in said bath can be withdrawn through said lock and said radiation chamber is equipped with means for indirectly cooling the synthesis gas and combustion residues therein by radiation cooling.

4,310,334

METHODS OF PRODUCING FUELS FROM SOLID MATERIALS

Robert D. Waldron, Houston, Tex., assignor to Dale D. Hammitt, Orange, Calif.

Filed Feb. 15, 1979, Ser. No. 12,562
Int. Cl.³ C07C *1/00*; C10J *3/00*
U.S. Cl. 48—197 R **20 Claims**



1. A process for producing fuel precursors comprising mixed metal carbide material, the process comprising the steps:

(a) carbonizing at a pyrolyzing temperature a raw carbonaceous material to remove volatile matter therefrom and form carbon as coke or char;

(b) mixing with said carbon a starting material selected from the group consisting of metal oxides, metal hydroxides, and mixtures thereof, said carbon being present in an amount sufficient to reduce said starting material to free metal and saturate said metal with carbon, such reduction proceeding by application of heat and removal of carbon oxides generated therein at an operating temperature sufficient to form from said metal and carbon a carbon-saturated molten metal;

(c) mixing said carbon-saturated molten metal with excess of said coke or char in a finely divided form while maintaining such mixture at a temperature above the freezing point of the molten metal for a time sufficient to convert a major fraction of the mixture to a metal carbide material and leave a minor fraction of unconverted molten metal-rich solution and unconverted carbon;

(d) removing and lowering the temperature of said carbide material; molten metal-rich solution and unconverted carbon in fine particulate form to give a product at which lower temperature the remaining molten material has become so viscous that migration of carbon or carbide particles is inhibited and at least a portion of said metal carbide material is capable of being formed into a metal carbide of higher carbon content, holding said product at said lower temperature for further conversion of said unconverted molten rich solution and unconverted carbon to a metal carbide, and for further conversion of said portion of metal carbide material formed in step (c) to a metal carbide comprising carbides of higher carbon content than said metal carbide material formed in step (c);

(e) dividing and consolidating said product after the further conversion of step (d) into agglomerates for storage or handling; the agglomerates consisting of metal carbides and a substance selected from the group consisting of interstitial metal-rich phases, free carbon, and mixtures thereof and

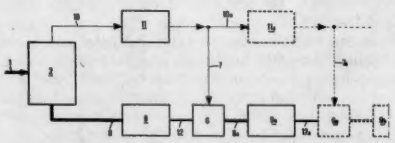
(f) cooling the agglomerates sufficiently to permit storage or shipment as fuel precursers.

4,310,335

METHOD AND APPARATUS FOR CONVEYING THROUGH A PIPE A DIPHASIC FLUID OF HIGH FREE GAS CONTENT

Marcel Arnaudeau, Paris, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation-in-part of Ser. No. 16,467, Mar. 1, 1979, abandoned. This application Jul. 17, 1979, Ser. No. 58,336
Int. Cl.³ B01D *47/00*
U.S. Cl. 55—46 **9 Claims**



1. A method of simultaneously conveying through the same pipe both the liquid and gas components of a diphasic fluid of a gas/liquid volumetric ratio of at least 10% of gas, comprising separating from the diphasic fluid a liquid of reduced free gas content from a residual gas, said liquid comprising the liquid component of said diphasic fluid, carrying out the series of the following steps at least once, in order to obtain a new a diphasic fluid having a limited free gas content lower than a specified value, said series of the following steps comprising:

(a) increasing the pressure of said liquid of reduced free gas content,

(b) independently simultaneously increasing to the same value the pressure of the residual gas, and

(c) producing a new diphasic fluid of redcuced free gas content by admixing said liquid of reduced free gas content with said residual gas; said new diphasic fluid being introduced into said conveying pipe and conveyed therethrough.

4,310,336

FILTER BAG ATTACHMENT

Harley G. Peterson, La Crescenta, Calif., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

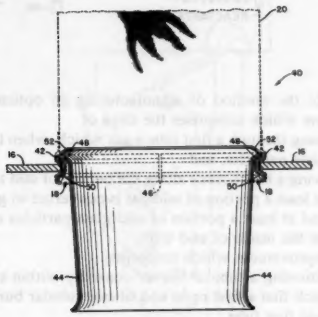
Filed Feb. 25, 1980, Ser. No. 124,181
Int. Cl.³ B01D *46/02*
U.S. Cl. 55—377 **6 Claims**

1. In a baghouse arrangement for filtering particulate matter

from a gaseous stream including at least one plenum having a plate member provided with at least one opening defined by a peripheral edge for gas passage therethrough and at least one tubular filter bag with one of its ends for connection to said peripheral edge in flow-through communication with said plenum, the improvement comprising in combination:

(a) a split ring attached to said one end of said filter bag and adapted to be inserted into the opening of said plenum plate member; and

(b) a removable elongated rigid insert tube adapted to be inserted into said one end of said filter bag and into said ring;



(c) said insert tube having an upper peripheral rib portion of a diameter greater than the diameter of said opening such that when said ring is placed within said opening said insert tube is fitted through said ring with the lower portion of said insert tube extending below said plate member and the upper peripheral rib portion being in abutting relationship with said split ring to thereby maintain same in engagement with said peripheral edge of said opening whereby said filter bag is releasably connected to said plenum plate member.

4,310,337

CRYOGENIC APPARATUS

Domenico S. Sarcia, Carlisle, Mass., assignor to Oerlikon-Buhrle U.S.A. Inc., New York, N.Y.

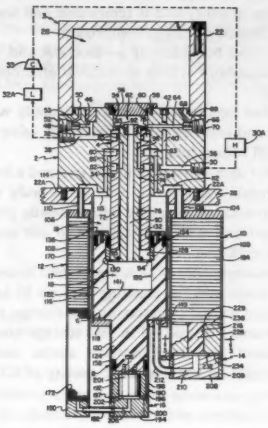
Continuation-in-part of Ser. No. 89,274, Oct. 29, 1979. This application Sep. 9, 1980, Ser. No. 185,563

Int. Cl.³ F25B *9/00*

U.S. Cl. 62—6 **21 Claims**

1. In a cryogenic refrigerator in which (a) fluid under pressure is cooled by heat exchange and expansion in the course of its being transferred into and out of a chamber of variable volume via a thermal regenerator, (b) transfer of the fluid is achieved by reciprocal movement of displacer means and (c) a cyclically operating valve means controls introduction of high pressure fluid to and discharge of low pressure fluid from the chamber, the improvement comprising a displacer means having first and second displacer sections, means cooperating with said displacer means so as to define first, second and third chambers of variable volume, a control valve means comprising a valve casing and a valve member slidably mounted to said valve casing, said valve casing having a high pressure inlet port, a low pressure outlet port, and at least one transfer port, said valve member being movable between predetermined first and second limit positions and being arranged so that it alternately connects said inlet and outlet ports to said transfer port when in said first and second limit positions respectively, said valve also including means for transmitting fluid under pressure to said third chamber, first and second regenerator means connected to transfer fluid between said transfer port and said first and second chambers respectively, heat exchanger means for exchanging heat with the fluid transferred to said first and second chambers respectively, and

means for (a) causing said valve member to be shifted to said first limit position by said displacer means as said displacer



means moves in a first direction and (b) causing said valve member to be shifted to said second limit position by said displacer means as said displacer means moves in a second opposite direction.

4,310,338

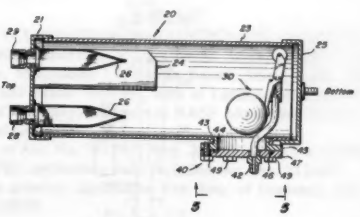
REPLACEABLE FLOAT OIL SEPARATOR

Ernest W. Schumacher, De Soto, Tex., and Stephen E. Evans, Beltsville, Md., assignors to Virginia Chemicals Inc., Portsmouth, Va.

Filed Mar. 31, 1980, Ser. No. 135,780

Int. Cl.³ F25B *43/02*

U.S. Cl. 62—470 **22 Claims**



1. In an oil separator of the repairable type, having a cylindrical shell and top and bottom closures for forming a pressure vessel for installation in a large refrigeration system of the vapor compression type between the compressor and the condenser, wherein a refrigeration oil and a refrigerant are combined and circulated throughout the refrigeration system, said oil being soluble at ambient and higher temperatures in said refrigerant but being insoluble at refrigeration temperatures, the improvement in said oil separator that provides hermetic attachment of said top and bottom closures to said shell and comprises:

A. a removal assembly, comprising:

(1) a flange cover which is semi-hermetically attached to a flanged opening in said cylindrical shell, said flanged opening being near the bottom of said shell, and

(2) an oil return tube which is disposed approximately perpendicularly to the longitudinal axis of said shell, for

returning a storage quantity of said oil to the sump of said compressor, and which has a discharge end and an intake end, said discharge end being rigidly and sealably attached to said flange cover; and

B. a valve assembly which is substantially immersed in said storage quantity and is removable and insertable through said flanged opening, comprising:

(1) a valve body having a valve seat and, in flow connection, a bore which is sealably attached to said intake end,

(2) a valve needle which moves slideably within said valve body and sealably seats against said valve seat for closing said oil return tube,

(3) a lever arm, having an upper end and a lower end, which is pivotably attached to said valve body with a body pin and to said valve needle with a needle pin,

(4) a float ball which is attached to and supported by said upper end, and

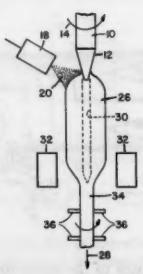
(5) a counterweight which is attached to and supported by said lower end for enabling said oil to be separated and returned to said compressor at a storage penalty of about 0.04 ounces of said oil in said storage quantity per psi of increased operating pressure across said valve needle when said oil has a specific gravity of 0.88–0.94.

4,310,339

METHOD AND APPARATUS FOR FORMING AN OPTICAL WAVEGUIDE PREFORM HAVING A CONTINUOUSLY REMOVABLE STARTING MEMBER

Michael G. Blankenship, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jun. 2, 1980, Ser. No. 155,422
Int. Cl.³ C03B *37/025, 37/075*
U.S. Cl. 65—3.12 **43 Claims**



1. A substantially continuous method of forming an article comprising the steps of

providing a starting member or bait,

applying particulate material to the exterior surface of said starting member to form a coating thereon,

longitudinally translating said coating while simultaneously applying additional quantities of said particulate material to said coating whereby a body is formed, said body being thereafter longitudinally translated, and

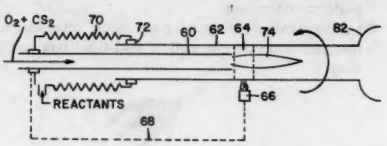
continuously removing said starting member from said body by said longitudinal translation of said body as said additional quantities of said particulate material is applied, a longitudinal aperture remaining in said body following said removal of said starting member.

4,310,340

METHOD AND APPARATUS FOR MAKING OPTICAL FIBER WAVEGUIDES

Arnab Sarkar, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 24, 1980, Ser. No. 172,068
Int. Cl.³ C03B *37/07, 37/075*
U.S. Cl. 65—3.12 **10 Claims**



1. In the method of manufacturing an optical waveguide preform which comprises the steps of

passing through a first tube a gas which, when heated, forms glass particles, and

moving a heat source along the outside of said tube whereby at least a portion of said gas is converted to glass particles and at least a portion of said glass particles are deposited on the inside of said tube,

the improvement which comprises

positioning a tubular burner coaxially within said first tube such that a first open end of said tubular burner is within said first tube,

reciprocatingly moving said first end of said burner with respect to said first tube,

passing said gas between said first tube and said burner,

maintaining said first end of said burner a fixed distance from and upstream of said heat source, and

flowing from said first open end of said burner a fuel which generates an axial, water-free flame that extends through said hot zone and downstream therefrom.

4,310,341

REMOVAL OF —OH IMPURITIES FROM FIBER OPTIC PRECURSOR MATERIALS

Robert L. Barns, and Edwin A. Chandross, both of Berkeley Heights, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 12, 1980, Ser. No. 186,590
Int. Cl.³ C03C *25/00*
U.S. Cl. 65—3.12 **8 Claims**

1. A method of reducing the amount of hydroxyl (—OH) containing impurities in an impure liquid chloride selected from the group consisting of $SiCl_4$, $GeCl_4$, and $POCl_3$, CHARACTERIZED by reacting with said impure chloride a mixture of a first reactant selected from the group consisting of PCl_3 and PBr_3 and a second reactant selected from the group consisting of chlorine and bromine.

4,310,342

METHOD AND APPARATUS FOR PREHEATING PULVEROUS MATERIALS AT REDUCED PRESSURE PRIOR TO THEIR INTRODUCTION INTO A MELTING FURNACE

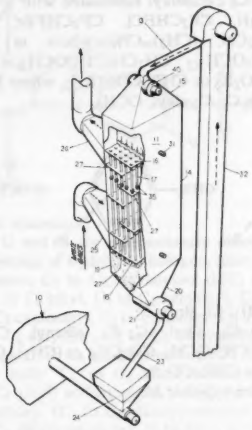
Raymond S. Richards, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 190,158, Sep. 24, 1980, abandoned. This application Dec. 11, 1980, Ser. No. 215,479
Int. Cl.³ C03B *3/00*
U.S. Cl. 65—27 **26 Claims**

1. The process of preheating pulverous glass batch prior to its delivery to a glass melting furnace comprising the steps of introducing the fully-intermixed, glass batch constituents into the upper region of a tubular heat exchanger, allowing the glass batch to flow downwardly by gravity through a plurality

of open-ended tubes of said heat exchanger, passing hot gases upwardly through said heat exchanger around the exterior of said open-ended tubes to heat the glass batch contained therein by countercurrent indirect heat transfer, maintaining a sub-atmospheric pressure over the glass batch contained in said open-ended tubes to remove the contained moisture, and delivering the said heated glass batch from the bottom of said heat exchanger into the glass melting furnace.

9. Combined apparatus for preheating glass furnace batch comprising an elongated vertically-mounted heat exchanger having a plurality of open-ended tubes extending throughout a major central portion of its height, means for delivering glass



batch in fully-intermixed condition to an upper region of said heat exchanger for its passage by gravity through said open-ended tubes, means for introducing hot gases from said glass furnace into a lower region of said heat exchanger to circulate upwardly between the said open-ended tubes, baffle means mounted around said tubes to direct said hot gases in a circuitous path around said tubes and out of contact with said glass batch for indirect heat transfer, and means for creating sub-atmospheric pressure within the upper region of said heat exchanger to remove the contained moisture in vapor form, and means for delivering the said glass batch to said glass furnace in essentially moisture-free preheated condition.

4,310,343

PROCESS FOR MAKING LIQUID FERTILIZER

William J. Verdegaal, and George F. Verdegaal, both of Hanford, Calif., assignors to Verdegaal Bros. Fertilizer, Hanford, Calif.

Filed Nov. 27, 1979, Ser. No. 97,681
Int. Cl.³ C05C 9/00
U.S. Cl. 71—28 **5 Claims**

1. In a process for making a concentrated liquid fertilizer by reacting sulfuric acid and urea, to form an end product,, the improvement comprising:

a. providing a non-reactive, nutritive heat sink, capable of dissipating the heat of urea and sulfuric acid, in an amount at least 5% of the end product.

b. adding water to the heat sink in an amount not greater than 15% of the end product,

c. adding urea to the mixture in an amount of at least 50% of the total weight of the end product.

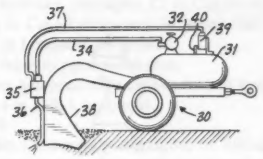
d. adding concentrated sulfuric acid in an amount equal to at least 10% of the total weight of the end product.

4,310,344

METHOD AND APPARATUS FOR THE ADIABATIC EXPANSION OF LIQUID ANHYDROUS AMMONIA

William L. Kjelgaard, and Paul M. Anderson, both of State College, Pa., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 840,845, Oct. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 716,203, Aug. 20, 1976, abandoned, which is a division of Ser. No. 506,516, Sep. 16, 1974, Pat. No. 3,978,681. This application Oct. 19, 1979, Ser. No. 86,346
Int. Cl.³ C05C 3/00
U.S. Cl. 71—61 **11 Claims**



1. In an operation wherein a nitrogen source is applied to the soil as fertilizer by means of a distribution conduit to promote the growth of plants and the like in the soil, the improvement which comprises employing as said nitrogen source a stream of cold anhydrous ammonia, said stream of cold anhydrous ammonia being at ambient or atmospheric pressure when passing through said conduit and into the soil, said stream of cold anhydrous ammonia being introduced into the soil beneath the surface thereof, said stream of cold anhydrous ammonia being obtained by adiabatically expanding a pressurized stream of anhydrous liquid ammonia, said pressurized stream of anhydrous liquid ammonia being expanded being at ambient temperature.

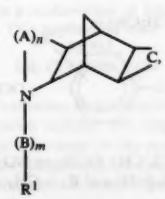
4,310,345

POLYCYCLIC NITROGEN-CONTAINING COMPOUNDS

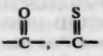
Rolf Platz, Mannheim; Werner Fuchs, Ludwigshafen; Norbert Rieber, Mannheim; Ulf-Rainer Samel, Mutterstadt; Johann Jung, and Bruno Wuerzer, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 781,767, Mar. 28, 1977, Pat. No. 4,189,434. This application Jan. 16, 1980, Ser. No. 112,437
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615878
Int. Cl.³ C07D 487/04
U.S. Cl. 71—76 **6 Claims**

1. A polycyclic nitrogen-containing compound of the formula

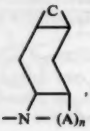


where A denotes the radical —N=N—, B denotes the radicals —SO_2—,



and —S—, C denotes the radicals —N=N— or

n denotes one of the integers 0 and 1, m is 1, and R^1 is linked to B through O or N and denotes radical —OAlk(Ar), the radical



or —N(Alk,Ar)$_2$, Alk denoting alkyl and Ar denoting an aromatic radical and R^2 and R^3 are identical or different and each denotes $(B)_m$—R^4, R^4 having the same meanings as R^1, and salts of these compounds.

2. A process for reducing crop plant growth height wherein the crop plants or the soil are treated with an effective amount of a polycyclic nitrogen-containing compound of the formula of claim 1 to reduce crop plant growth height.

4,310,346

N(SUBSTITUTED PHENYLSULFONYL) N'(SUBSTITUTED CYUMIDIN-2- yl) UREAS

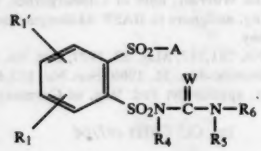
George Levitt, Wilmington, and Richard F. Sauers, Hockessin, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 130,342, Mar. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 59,153, Jul. 20, 1979, abandoned. This application May 30, 1980, Ser. No. 152,022

Int. Cl.[3] **A01N** *9/22*; **C07D** *239/42*

U.S. Cl. 71—92 **34 Claims**

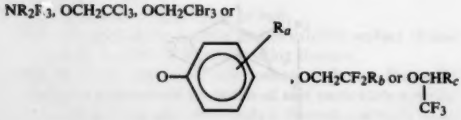
1. A compound of the formulae



I

wherein

A is

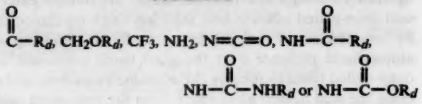


where R_a is H, Cl, CH_3, OCH_3 or NO_2 and R_b is H, F or C_1–C_2 alkyl with 0–5F and R_c is CH_3 or CF_3;

R_1 is

H, Cl, Br, F, C_1–C_3 alkyl, NO_2, OCH_3,

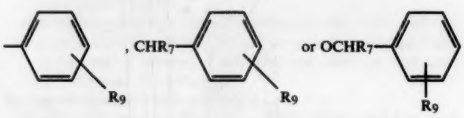
-continued



where R_d is C_1–C_3 alkyl, or R_1 is $N(CH_3)_2$, CN, $CH_2S(O)_nCH_3$ or $S(O)_nCH_3$, where n is 0, 1 or 2;

R_1' is H, Cl, F, Br, CH_3 or OCH_3;

R_2 is H, C_1–C_6 alkyl, C_3–C_4 alkenyl, C_3–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl, C_5–C_6 cycloalkenyl, C_3–C_5 alkynyl, C_3–C_6 cycloalkyl substituted with 1–2 CH_3 groups, CF_2CF_2H, CF_2CHFCl, CF_2CHFBr, CF_2CHFCF_3, $C(CH_3)_2CN$, $(CH_2)_mCN$, where m is 1 or 2, $CH_2CH_2OCH_3$, $CH_2CH(CH_3)OCH_3$, $(CH_2)_3OCH_3$, $CHR_7CO_2R_8$ or $CHR_7CON(R_8)_2$, where R_7 is H or CH_3 and R_8 is C_1–C_3 alkyl, OCH_3,

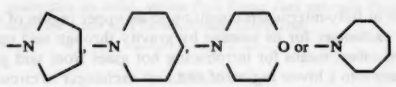


where

R_9 is H, CH_3, Cl, Br or F;

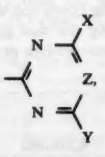
R_3 is C_1–C_4 alkyl, C_3–C_4 alkenyl, $CH_2CH_2OCH_3$, $CH_2CH(CH)_3OCH_3$, CH_2CF_3, or $(CH_2)_mCN$, where m is 1 or 2, or $CHR_7CO_2R_8$,

NR_2R_3 taken together are



R_4 and R_5 are independently H or CH_3, but R_4 and R_5 cannot both be CH_3;

R_6 is



wherein

X is H, CH_3, CH_3O or CH_3CH_2O;

Y is Cl, Br, H, C_1–C_3 alkyl, CF_3, $NHCH_3$ $N(CH_3)_2$, OCH_2CF_3, OCH_3, OC_2H_5, SCH_3, $O(CH_2)_pOR_{10}$, where p is 2 or 3 and R_{10} is CH_3 or C_2H_5, $CH_2CH_2OCH_3$, CH_2OCH_3, $CH_2OCH_2CH_3$, $OCHR_7CO_2R_{11}$, $OCHR_7CON(R_8)_2$, CO_2R_{11} and $CH_2CO_2R_{11}$, where R_{11} is H or C_1–C_3 alkyl, CH_2CN, $NCH_3(CH_2CN)$, CH_2CH_2CN, CH_2Cl, N_3, $OCH_2CH{=}CH_2$ or $OCH_2C{\equiv}CH$;

provided that:

(1) when R_2 is OCH_3, R_3 is CH_3;

(2) when R_2 is CF_2CHFCl, CF_2CHFBr, CF_2CF_2H or CF_2CHFCF_3, then R_3 is C_1–C_4 alkyl;

and their agriculturally suitable salts.

2. The compounds of claim 1 wherein $R_4{=}R_5{=}H$.

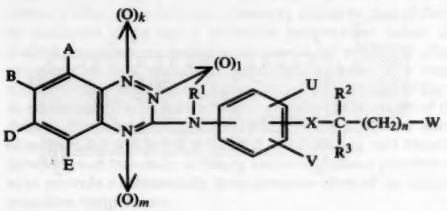
28. A composition for the control of undesirable vegetation consisting essentially of a compound of claim 2 and at least one of (a) a surface-active agent and (b) a solid or liquid diluent.

4,310,347
HERBICIDAL 1,2,4-BENZOTRIAZINES

Alexander Serban, Doncaster; Graeme Farquharson, Reservoir; Jack Lydiate, Viewbank, and Graham J. Bird, North Melbourne, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Aug. 25, 1980, Ser. No. 181,247
Claims priority, application Australia, Aug. 31, 1979, PE0299; May 8, 1980, PE3053
Int. Cl.³ A01N *43/64*; C07D *253/08*
U.S. Cl. 71—93 14 Claims

1. A compound of formula I



I

or a salt thereof wherein:

A, B, D, E, U and V are independently chosen from the group consisting of hydrogen, halogen, nitro, cyano, thiocyano, amino, C_1 to C_6 alkylamino, di(C_1 to C_6 alkyl) amino, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_2 to C_6 alkenyl, C_3 to C_7 cycloalkyl, C_1 to C_6 alkoxy, C_1 to C_6 haloalkoxy, C_1 to C_6 alkylthio, C_1 to C_6 alkylsulfinyl, C_1 to C_6 alkylsulfonyl, C_1 to C_6 haloalkylsulfinyl, C_1 to C_6 haloalkylsulfonyl, sulfo, C_1 to C_6 alkoxysulfonyl, sulfamoyl, N-(C_1 to C_6 alkyl) sulfamoyl, N,N-di(C_1 to C_6 alkyl)sulfamoyl, carboxy, (C_1 to C_6 alkoxy)carbonyl, carbamoyl, N-(C_1 to C_6 alkyl)carbamoyl, N,N-di(C_1 to C_6 alkyl)carbamoyl, phenyl, phenoxy, phenylthio, and the groups substituted phenyl, substituted phenoxy and substituted phenylthio wherein in each group the phenyl ring is substituted with from one to three substituents chosen from the group consisting of halogen, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy, nitro and cyano;

R^1 is chosen from the group consisting of hydrogen, C_1 to C_{10} alkyl, C_2 to C_{10} alkenyl, C_2 to C_{10} alkynyl, C_2 to C_{10} alkoxyalkyl, cyanomethylene, (C_1 to C_6 alkoxy)carbonylmethylene, C_1 to C_{10} haloalkyl, formyl, C_2 to C_{10} alkanoyl, phenyl, benzyl, benzoyl, and the groups phenyl, benzyl and benzoyl wherein in each group the phenyl ring is substituted with from one to three substituents chosen from the group consisting of halogen, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy, nitro and cyano;

R^2 is chosen from the group consisting of hydrogen, C_1 to C_6 alkyl, C_2 to C_6 alkenyl, C_2 to C_6 alkoxyalkyl, C_1 to C_6 haloalkyl, acetyl, propionyl, and C_2 to C_6 alkoxycarbonyl;

R^3 is chosen from the group consisting of hydrogen, C_1 to C_6 alkyl, C_2 to C_6 alkenyl, C_2 to C_6 alkoxyalkyl and C_1 to C_6 haloalkyl, or R^2 and R^3 together may form a methylene, ethylidene, propylidene or isopropylidene group;

W is chosen from the group consisting of cyano, thiocarbamoyl,

and CH_2Z wherein:

G is chosen from the group consisting of hydroxy, mercapto, C_1 to C_{10} alkoxy, C_1 to C_{10} haloalkoxy, C_2 to C_{10} alkenyloxy, C_2 to C_{10} alkynyloxy, C_1 to C_{10} alkylthio, C_2 to C_{10} alkenylthio, C_2 to C_{10} alkynylthio, C_3 to C_7 cycloalkoxy, C_3 to C_7 cycloalkoxy substituted with one or two C_1 to C_4 alkyl groups, phenoxy, phenylthio, benzyloxy, benzylthio, the group C_1 to C_6 alkoxy substituted with a substituent chosen from the group consisting of C_1 to C_6 alkoxy, amino, ammonio, cyano, N-(C_1 to C_6 alkyl)amino, N,N-di(C_1 to C_6 alkyl)amino, and N,N,N-tri(C_1 to C_6 alkyl)ammonio, the groups phenoxy, phenylthio, benzyloxy and benzylthio wherein in each group the phenyl ring is substituted with from one to three substituents chosen from the group consisting of halogen, nitro, cyano, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl and C_1 to C_6 alkoxy, the group OM wherein M is the cation of an inorganic or organic base, the group $—NHSO_2R^4$ wherein R^4 is chosen from C_1 to C_{10} alkyl and C_1 to C_{10} haloalkyl, and the group $—NR^5R^6$ wherein R^5 and R^6 are independently chosen from the group consisting of hydrogen, C_1 to C_6 alkyl, C_1 to C_6 hydroxyalkyl, C_1 to C_6 haloalkyl, phenyl, and benzyl, and the group $—O—N=R^{10}$ wherein R^{10} is a C_1 to C_{10} alkylidene group; and Z is chosen from halogen, hydroxy, mercapto, C_1 to C_{10} alkoxy, C_1 to C_{10} haloalkoxy, C_1 to C_{10} alkylthio and the group NR^5R^6 wherein R^5 and R^6 are as hereinbefore defined;

X is chosen from oxygen and sulfur;

k, l and m are independently chosen from 0 and 1 provided that k+l+m is 0, 1 or 2; and

n is 0, 1 or 2.

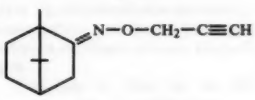
12. A process for severely damaging or killing unwanted plants which process comprises applying to said plants, or to the growth medium of said plants, an effective amount of a compound as defined according to claim 1.

4,310,348
PLANT GROWTH REGULATING COMPOSITIONS

Zoltan Budai; Ferenc Jurak, both of Budapest; Attila Kis-tamás, Pilisvorosvar; Aranka Lay née Kónya, Budapest; Tibor Mezei, Budapest; Zoltan Vig, Budapest, and Terez Zubovits nee Kristof, Budapest, all of Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Division of Ser. No. 65,156, Aug. 9, 1979, Pat. No. 4,244,888.
This application Jul. 9, 1980, Ser. No. 166,975
Claims priority, application Hungary, Aug. 22, 1978, EE 2589
Int. Cl.³ A01N *33/02*
U.S. Cl. 71—121 1 Claim

1. A plant growth promoting composition comprising as active agent 0.001 to 98% by weight of racemic and/or optically active 2-(propargyloxyimino)-1,7,7-trimethyl-bicyclo[2,2,1]heptane of the formula (I),



(I)

along with a conventional inert diluent.

4,310,349
HIGHLY ORIENTABLE IRON PARTICLES

Hillard M. Kahan, San Francisco; William F. Acebo, Hayward, and Michael K. Stafford, Santa Clara, all of Calif., assignors to Ampex Corporation, Redwood City, Calif.

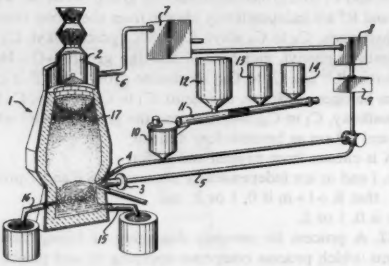
Continuation-in-part of Ser. No. 89,782, Oct. 31, 1979, abandoned, which is a continuation of Ser. No. 8,949, Feb. 2, 1979, abandoned. This application May 23, 1980, Ser. No. 152,933
Int. Cl.³ B22F *9/00*
U.S. Cl. 75—0.5 R 4 Claims

1. In a process of reducing an acicular iron oxide to produce acicular metal particles suitable for magnetic recording by heating said acicular iron oxide in the presence of a reducing gas the improvement comprising treating the oxide particles with an aqueous solution of sodium tripolyphosphate, drying the thus treated oxide to produce a matrix, and reducing the oxide by subjecting the thus formed matrix to contact with a reducing gas at an elevated temperature.

4,310,350
RECOVERING NON-VOLATILE METALS FROM DUST CONTAINING METAL OXIDES

Sven Santen, Hofors, Sweden, assignor to SKF Steel Engineering Aktiebolag, Hofors, Sweden

Filed Oct. 24, 1980, Ser. No. 200,153
Claims priority, application Sweden, Jun. 10, 1980, 8004313
Int. Cl.[3] C21C 5/52
U.S. Cl. 75—10 R 6 Claims



1. A method of recovering nonvolatile metals from material in dust form containing metal oxides in a reactor having an upper and a lower portion, said material containing at least one of the group consisting of chromium, nickel and molybdenum, comprising the steps of blowing the material together with carbon containing coal powder into the lower portion of the reactor, said reactor containing a solid reducing agent at least in said lower portion, passing said material and powder into a reduction zone within said solid reducing agent in said lower portion, said reduction zone being maintained by the use of a plasma generator adjacent thereto, substantially instantaneously melting and reducing said starting material in said reduction zone, and removing the melted and reduced metal product from the bottom of the reactor.

4,310,351
METHOD FOR RECOVERING LEAD FROM BATTERIES

Benjamin Lieberman, 901 Valley Rd., Charleston, W. Va. 25302

Filed Jun. 9, 1980, Ser. No. 157,224
Int. Cl.[3] C22B 13/00
U.S. Cl. 75—77 3 Claims

1. A method of obtaining crude metallic lead from scrap storage batteries comprising:

providing relatively dry storage battery grids including positive grids comprised of metallic lead and lead dioxide;

tumbling said grids at a slow speed thereby breaking said grids into large pieces and disengaging said lead dioxide;

separating said disengaged lead dioxide using a screen through which said lead dioxide passes while retaining an oversized fraction relatively free of lead dioxide; and

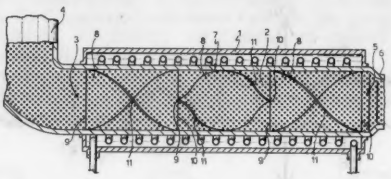
melting said oversized fraction in a crucible at a temperature of between 350° C. to 375° C. thereby

obtaining crude metallic lead, said method thereby resulting in higher yields because the decreased presence of lead dioxide minimizes the oxidation of the obtained crude metallic lead during smelting.

4,310,352
PROCESS FOR THE PREPARATION OF A MIXTURE COMPRISING A SOLID PHASE AND A LIQUID PHASE OF A METAL ALLOY, AND DEVICE FOR ITS PERFORMANCE

Giovanni Manfre, Vinovo, Italy; Jonathan Mironi, Haifa, Israel, and Renzo Moschini, Senigallia, Italy, assignors to Centro Ricerche Fiat S.p.A., Turin, Italy

Filed Jun. 16, 1980, Ser. No. 160,023
Claims priority, application Italy, Jun. 20, 1979, 68310 A/79
Int. Cl.[3] C22B 9/00
U.S. Cl. 75—93 R 10 Claims



1. A process for the preparation of a mixture comprising a solid phase and a liquid phase of a metal alloy, in which the concentration of the said solid phase has a pre-established value, characterized in that said process comprises at least a first stage for bringing the said alloy into a completely fluid state, a second stage for creating a constant range flow of the said alloy in said fluid state through a body between an inlet section and an outlet section, a third stage for subdividing in a longitudinal direction the said flow into a plurality of flow sections each of which has a predetermined length and in each of which the flow is subdivided into at least two independent streams, and a fourth stage for making each of the said streams flow along such a trajectory as to obtain in each of the said streams of each flow section a confluence of parts of both streams of the immediately preceding section, said third and fourth stages being contemporaneously obtained by fixed separator and conveyance means, the said alloy being cooled while it moves along the said flow so that the material of the said alloy will be subjected, between the inlet and outlet sections, to a high thermal gradient in order to produce the formation of said solid phase to obtain said mixture, and will be subjected to a different shear rate during the passage from one to the other of the said sections in order to produce the break and to prevent the growth of the dendritic bounds which tend to form in the solid phase.

4,310,353
LOW-ANTIMONY LEAD ALLOY

Eberhard Nann, Soest-Deiringsen, and Ulrich Heubner, Bad Homburg, both of Fed. Rep. of Germany, assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 25, 1980, Ser. No. 124,503
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1979, 2907227
Int. Cl.[3] C22F 11/10; C22C 11/08
U.S. Cl. 75—166 B 22 Claims

1. An antimony-lead alloy consisting essentially of:

antimony in an amount of 0.05 up to less than 1.5 weight percent,

arsenic in an amount of 0.02 to 0.5 percent by weight, selenium in an amount of 0.005 to 0.1 percent by weight,

tin in an amount of 0.002 to 0.5 percent by weight, bismuth, said bismuth being present in an amount up to 300 grams per metric ton, the balance being lead with the usual impurities due to manufacture.

4,310,354
PROCESS FOR PRODUCING A SHAPE MEMORY EFFECT ALLOY HAVING A DESIRED TRANSITION TEMPERATURE

Richard W. Fountain, New Hartford; William J. Boesch, Utica, and Steven H. Reichman, New Hartford, all of N.Y., assignors to Special Metals Corporation, New Hartford, N.Y.

Filed Jan. 10, 1980, Ser. No. 111,047
Int. Cl.³ B22F 3/00
U.S. Cl. 75—211 **5 Claims**

1. A process for producing a shape memory effect alloy having a desired transition temperature, which comprises the steps of: providing at least one prealloyed powder of a shape memory effect alloy having a chemistry similar to that of the to be produced alloy and a transition temperature below the desired transition temperature of the to be produced alloy; providing at least one other prealloyed powder of a shape memory effect alloy having a chemistry similar to that of the to be produced alloy and a transition temperature in excess of the desired transition temperature of the to be produced alloy; blending said prealloyed powders; consolidating said blended powders; and thermally diffusing said consolidated powders so as to provide a substantially homogeneous alloy of the desired transition temperature.

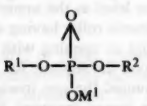
4,310,355
INTERNAL RELEASE AGENT FOR THERMOSETTING AMINOPLAST RESINS

Peter Dorries, Frankfurt am Main, and Karl-Heinz Keil, Offenbach am Main, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

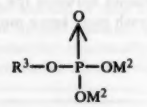
Filed Sep. 19, 1980, Ser. No. 188,934
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 2948184
Int. Cl.³ C09D 5/20
U.S. Cl. 106—2 **8 Claims**

1. Internal release agent for thermosetting aminoplast resins which is an aqueous solution or dispersion containing

(a) 5–30% by weight of a mixture of 50–100% by weight of a compound of the formula



and 0 to 50% by weight of a compound of the formula

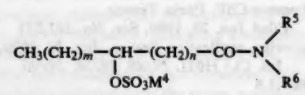


and an acid salt selected from (b), (c) and (d) wherein

(b) is 2–15% by weight of a compound of the formula

R^4-$COOM^3$ or R^4-SO_3M^3,

(c) is 0.5 to 10% by weight of a compound of the formula

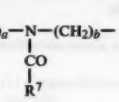


and (d) is a mixture of (b) and (c);

wherein

R^1, R^2 and R^3 independently of one another are straight-chain or branched alkyl or alkenyl having 5 to 12 carbon atoms or phenalkyl or naphthalkyl having 7 to 13 carbon atoms;

R^4 is alkyl having 10 to 22 carbon atoms, alkylphenyl or alkylnaphthyl having 1 to 12 carbon atoms in the alkyl chain or a moiety of the formula



wherein a is a number from 0 to 2, b is a number from 1 to 3 and the sum of a and b is a number from 1 to 3;

R^5 is alkyl or alkenyl having 1 to 8 carbon atoms, phenyl, alkylphenyl or phenalkyl with each having 1 to 4 carbon atoms in the alkyl chain;

R^6 is hydrogen, alkyl or alkenyl having 1 to 8 carbon atoms, phenyl, alkylphenyl or phenalkyl with each having 1 to 4 carbon atoms in the alkyl chain;

R^7 is alkyl having 11 to 20 carbon atoms;

M^1, M^2, M^3 and M^4 are identical or different and are an alkali metal cation, ammonium or amine cation, and one of the two M^2's additionally also may be hydrogen;

and m and n independently of one another are numbers from 6 to 8.

4,310,356
AQUEOUS NEWSPRINT INKS

Paolo C. Trubiano, Somerville, and Aaron Y. Cohen, Union, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater and Synres Chemical Corporation, Union, both of, N.J.

Filed Sep. 22, 1980, Ser. No. 189,975
Int. Cl.³ C09D 11/14
U.S. Cl. 106—25 **10 Claims**

1. An aqueous newsprint ink applicable for a light-weight keyless printing press system having a total solids content of about 13–80% and comprising about 2–30% of a carbon black pigment, about 3–60% of a dispersed starch, and water as the remainder of the ink in an amount to total 100%, wherein the percentages are by weight based on total weight of the ink.

4,310,357
LOW TEMPERATURE SEALING GLASS

Ichiro Matsuura, Otsu, and Fumio Yamaguchi, Shiga, both of Japan, assignors to Nippon Electric Glass Company, Limited, Otsu, Japan

Filed May 14, 1980, Ser. No. 149,160
Int. Cl.³ C03C 3/12
U.S. Cl. 501—15 **3 Claims**

1. A low temperature sealing glass composition consisting of vitreous solder glass of PbO-B_2O_3 system having a deformation point of 350° C. or less, in which the solder glass is 66.5 wt. % with the balance being willemite, and said solder glass comprising 85 wt. % of PbO, 13 wt. % of B_2O_3, 1 wt. % of SiO_2 and 1 wt. % of Al_2O_3.

4,310,358
COMPOSITION FOR FORMING INORGANIC HARDENED PRODUCTS AND PROCESS FOR PRODUCING INORGANIC HARDENED PRODUCTS USING THE SAME

Tomisaburo Azuma; Takeru Murakami, and Haruyuki Date, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Continuation of Ser. No. 107,105, Dec. 26, 1979, abandoned. This application Oct. 14, 1980, Ser. No. 196,976
Claims priority, application Japan, Dec. 26, 1978, 53/162778
Int. Cl.³ C04B 7/02
U.S. Cl. 106—97 **10 Claims**

1. A composition for forming inorganic hardened products,

which comprises a precursor for forming calcium aluminate sulfate trihydrate, which precursor is calcium aluminate monosulfate, gypsum and a cement material selected from the group consisting of Portland cement, blast furnace slag and a mixture thereof, the amount of each ingredient satisfying the following relations by weight:

$$1/0.2 > \text{calcium aluminate sulfate trihydrate} > 1/1.5$$

$$1/0.1 > \text{Precursor/Gypsum} > 1/1$$

wherein the calcium aluminate sulfate trihydrate is present in the theoretical amount produced by the reaction of said precursor of calcium aluminate sulfate trihydrate and gypsum.

4,310,359

PIGMENT COMPOSITIONS

Shigeyuki Ehashi, Kawagoe; Junichi Tsuchida; Kenichi Kakimoto, both of Toyko, and Hiromitsu Katsura, Tokorozawa, all of Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

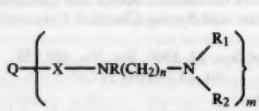
Filed Feb. 18, 1981, Ser. No. 235,556

Claims priority, application Japan, Feb. 25, 1980, 55/21698

Int. Cl.³ C09C *3/68*

U.S. Cl. 106—288 Q **9 Claims**

1. A pigment composition comprising a pigment and a colouring compound of the general formula (I),



(I)

wherein Q represents a residue of a colouring compound other than phthalocyanine, X represents —SO_2— or —CO—, m and n represent, respectively, an integer of from 1 to 4 and an integer of from 1 to 6, R represents a hydrogen atom, an alkyl group having from 1 to 20 carbon atoms or an alkenyl group having from 2 to 20 carbon atoms, and R_1 and R_2 represent, independently, a hydrogen atom, a substituted or unsubstituted alkyl group having from 1 to 20 carbon atoms or a substituted or unsubstituted alkenyl group having from 2 to 20 carbon atoms, or R_1 and R_2 together form a heterocyclic ring which contains a nitrogen, oxygen or sulfur atom therein.

4,310,360

METHOD FOR PRODUCING PIGMENT FOR USE IN SIZING COMPOSITIONS

Magnus B. Kvant, Lund, Sweden, assignor to Supra Aktiebolag, Sweden

Filed Oct. 24, 1979, Ser. No. 88,046

Claims priority, application Sweden, Oct. 30, 1978, 7811215

Int. Cl.³ C04B *31/40*

U.S. Cl. 106—306 **11 Claims**

1. A method of producing pigment for use in sizing or filler agents comprising the steps of bleaching calcium sulfate dihydrate, recovering a fraction of the said bleached sulfate of predetermined particle size, and beating an aqueous suspension of said bleached calcium sulfate dihydrate fraction in the presence of a dispersing agent comprising sodium carboxymethylcellulose, said suspension of bleached calcium sulfate dihydrate having a dry content in the range of from about 60 to about 80% by weight of said fraction, wherein the particle size distribution is such that 50% by weight of the solids in the beaten aqueous suspension has a particle size smaller than about 5μ.

4,310,361

SUGAR CANE MILL FACILITIES FOR THE EXTRACTION OF SUGAR FROM SUGAR CANE

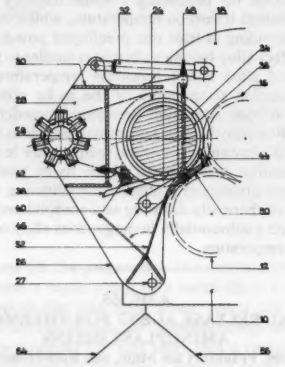
Jean-Pierre Georget, Denain, France, assignor to Fives-Cail Babcock, Paris, France

Continuation of Ser. No. 58,185, Jul. 17, 1979, abandoned. This application Dec. 11, 1980, Ser. No. 215,394

Claims priority, application France, Mar. 8, 1978, 78 22927

Int. Cl.³ C13D *1/04*; B30B *3/04*

U.S. Cl. 127—5 **10 Claims**



1. A sugar cane mill comprising

(a) a frame,

(b) an inlet roller and an outlet roller mounted on the frame,

(c) an upper roller resiliently biased towards the inlet and outlet rollers, the upper roller defining inlet and outlet nips with the inlet and outlet rollers, respectively,

(d) a support and a pivot extending parallel to the inlet and outlet rollers and pivotally mounting the support on the frame,

(e) a fourth roller mounted on the support forwardly of and at about the same level as the upper roller and above the inlet roller, the fourth roller having about the same diameter as and defining an opening with the upper roller,

(f) means acting upon the support for resiliently biasing the fourth roller mounted thereon towards the upper roller,

(g) adjustable stop means arranged to prevent the fourth roller resiliently biased towards the upper roller from contacting the upper roller, and

(h) a trash plate placed between the fourth roller and the inlet roller, the trash plate being mounted on the support.

4,310,362

METHOD OF MAKING SCHOTTKY DIODE WITH AN IMPROVED VOLTAGE BEHAVIOR

Marcel Roche, and Jean P. Litot, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 20, 1980, Ser. No. 161,571

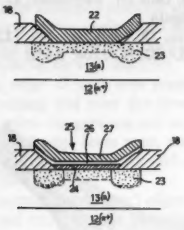
Claims priority, application France, Jun. 22, 1979, 79 16056

Int. Cl.³ H01L *29/48, 29/56, 29/90*

U.S. Cl. 148—1.5 **5 Claims**

1. A process for improving the behaviour under voltage of a Schottky diode, comprising an epitaxial layer doped according to a first conductivity type, a metal layer establishing the Schottky contact with a surface portion of the epitaxial layer and a metal guard ring on a chamfered insulating layer at the

periphery of the surface portion, said process consisting in depleting the space charge zone at the periphery of the diode



by local reduction of the doping level of the epitaxial layer, while maintaining the same conductivity type.

4,310,363

SEALED ELECTRIC PASSAGES

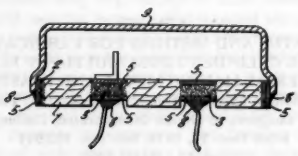
Jean Engdahl, Bienne, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Continuation-in-part of Ser. No. 576,172, May 9, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 762,224

Claims priority, application Switzerland, May 20, 1974, 6872/74

Int. Cl.³ B32B *15/04*

U.S. Cl. 148—31.5 **9 Claims**



1. An insulative body, or panel, constructed initially of a metallic oxide, said insulative body having a sealed electrically-conductive passage surrounded by insulation extending between two faces of said insulative body said passage having been formed by the process of subjecting said metallic oxide of said insulative body at said passage to heating in a reducing atmosphere a sufficient amount of time to reduce the metallic oxide initially present at said passage, and throughout said passage length, to a metal-like electrically conductive state but not the surrounding insulative metallic oxide.

4,310,364

EMULSION EXPLOSIVE SENSITIVE TO A DETONATOR

Gunnar O. Ekman, and Lars A. Granlund, both of Nora, Sweden, assignors to Nitro Nobel AB, Gyttorp, Sweden

Filed Jan. 3, 1980, Ser. No. 109,234

Claims priority, application Sweden, Jan. 15, 1979, 7900326

Int. Cl.³ C06B *45/00*

U.S. Cl. 149—2 **9 Claims**

1. An emulsion explosive of the water-in-oil type which is sensitive to a no. 8 detonator, consisting essentially of:

5–20 percent by weight of an organic phase consisting of aromatic nitro-compounds as a sensitizer, said nitro compounds being selected from the group consisting of mono-, di- and tri-nitro toluenes, mono-nitro benzene, di-nitro benzenes, mono- and di-nitroxylenes and mixtures of said nitro-compounds;

5–18 percent by weight water;

0.5–4 percent by weight of an emulsifier with a hydrophile-lipophile balance less than 7;

1–10 percent by weight of inorganic particles with enclosed or absorbed gas as "hot spots"; and

60–90 percent by weight of inorganic oxidizing salts in the water phase.

4,310,365

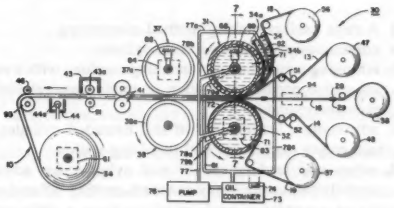
METHODS FOR THE MANUFACTURE OF MULTI-CONDUCTOR FLAT CABLE

William A. Elliott, Reynoldsburg, and Thomas J. Taylor, Gahanna, both of Ohio, assignors to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,599

Int. Cl.³ H01B *13/06, 13/22*

U.S. Cl. 156—55 **19 Claims**



1. A method of fabricating a flat cable with at least two arrays of conductors, comprising the steps of:

guiding at least two continuously advancing arrays of parallel extending conductors into a precisely controlled offset relationship therebetween;

isolating at least said two arrays of conductors with a continuously advancing bare center plastic film of the type that will not directly bond to said conductors in response to normal laminating temperatures and pressures;

overlying each array of conductors with a different continuously advancing, adhesive-backed outer insulative film;

passing the center film, two arrays of conductors and the two outer films through the nip of a pair of internally heated laminating rollers, one roller having a peripheral steel surface formed with a plurality of conductor-receiving grooves therein, and the other roller having a smooth, resilient peripheral surface;

applying external heat at a predetermined temperature to an arcuate portion of the roller with the resilient peripheral surface in a region immediately adjacent the nip of the two laminating rollers, and

applying a predetermined biasing force between the two laminating rollers which, in combination with the selective internal and external heating thereof, laminates the two arrays of conductors in an interleaved manner between, and within longitudinally disposed borders of the center film and the two outer films.

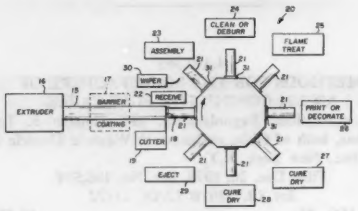
7. A method in accordance with claim 1, further comprising the step of:

positioning and securing a spaced array of insulative isolating strips on each side of, and extending transversely across, the center film at predetermined spaced cable termination points prior to that film, together with the isolating strips thereon, being advanced through the nip of the laminating rollers, the strips on opposite sides of the center film being aligned in pairs and of a type of material that will allow the two arrays of conductors in the laminated cable to subsequently be readily separated from the center film for connectorization.

4,310,366
RESIN CAULKER MAKING

Dick T. Van Manen, Canandaigua, N.Y., assignor to Voplex Corporation, Pittsford, N.Y.

Filed Jul. 17, 1980, Ser. No. 169,666
Int. Cl.[3] B29C *27/08;* B32B *1/10*
U.S. Cl. 156—69 12 Claims



1. A resin caulker making method comprising:
a. continuously extruding a resin cylinder;
b. arranging a multimandrel indexing machine with a receiving station positioned to align an empty mandrel with said extruded cylinder;
c. advancing a leading end of said extruded cylinder onto said empty mandrel at said receiving station;
d. when said leading end of said cylinder has advanced partially onto said empty mandrel, cutting off said cylinder at a predetermined length to form a resin caulker barrel supported on said mandrel;
e. indexing said machine after cutting off said barrel to move said cut off barrel to an assembly station and to bring another empty mandrel to said receiving station to receive said leading end of said cylinder;
f. joining an end closure to said barrel supported on said mandrel at said assembly station; and
g. using successive stations of said indexing machine for finishing, printing, and drying assembled caulkers supported on said mandrels.

4,310,367
METHOD OF SEALING AN ITEM IN A COVERING COMPRISING A COMPOSITION OF A POLYETHYLENE AND ISOBUTYLENE COPOLYMER

Anthony J. Berejka, Huntington, N.Y., assignor to Radiation Dynamics, Inc., Melville, N.Y.

Division of Ser. No. 38,062, May 11, 1979, Pat. No. 4,264,490.
This application Apr. 3, 1980, Ser. No. 137,079
Int. Cl.[3] B29C *27/22;* B32B *31/26, 31/28*
U.S. Cl. 156—85 4 Claims

1. A method of sealing an item in a covering comprising:
(a) forming a sheet or film of material of a composition comprising a cross-linkable polyethylene and a copolymer of isobutylene and conjugated diene wherein a sufficient quantity of isobutylene copolymer to render the sheet or film heat sealable or sealable onto itself or other polyolefin compositions,
(b) irradiating said sheet or film thereby to cross-link the polyethylene,
(c) heating said sheet or film to a temperature above its crystalline softening point,
(d) stretching said sheet or film and cooling it while stretched so as to establish the stretched dimension,
(e) wrapping said item in said sheet or film,
(f) heat sealing the seams of said wrap, and
(g) heating said sheet to a temperature above its crystalline softening point thereby to cause recovery of the sheet dimension to a lesser dimension.

4,310,368
PROCEDURE FOR MANUFACTURING JAI ALAI BASKETS

Jose M. F. Urquiaga, calle Dr. Barraquer, 12 entl' 1, Castelldefels (Barcelona), Spain

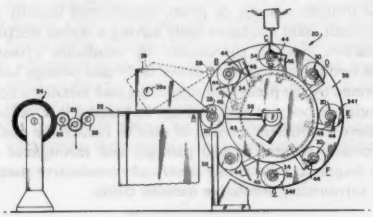
Filed Feb. 19, 1980, Ser. No. 122,682
Int. Cl.[3] B32B *31/04;* A63B *59/02*
U.S. Cl. 156—148 8 Claims

1. A process of manufacturing Jai Alai baskets, comprising the steps of forming a plastic ring unit by molding; molding ribs from plastic; placing said ring unit and said ribs in a detachable springing frame so as to secure said ribs and said ring unit in the predetermined position required for stringing; obtaining strips of extruded plastic material each having a body of a substantially rectangular cross-section and extensions outwardly projecting therefrom, and stringing said ribs and said ring unit with said strips while simultaneously placing the extensions of the adjacent strips so that the extensions of the strips are flattened by the extensions of the colaterally located strips so as to form a basket suitable for playing Jai Alai.

4,310,369
APPARATUS AND METHOD FOR FABRICATING A FLEXIBLE CYLINDER FROM MULTI-PLY FLEXIBLE WEB MATERIAL HAVING METAL AND PLASTIC PLIES

William P. Miller, Meriden, Conn., and Robert W. Twigg, Rockford, Ill., assignors to Dixico Incorporated, Dallas, Tex.

Filed Dec. 12, 1979, Ser. No. 102,911
Int. Cl.[3] B31C *1/00*
U.S. Cl. 156—218 11 Claims



1. The method for forming flexible cylindrical bodies from a web material on cylinder forming units arranged around the periphery of a rotatable disk comprising the steps of:
feeding said web material between a cylindrical cavity and a cylindrical mandrel mounted within said cavity on a first one of said cylinder forming units, the clearance between said mandrel and said cavity being only slightly greater than the thickness of said web material, said clearance being large enough to assure ready passage of the web material between said mandrel and said sidewall and being small enough to assure the formation of an essentially uniform and circular cylindrical body from said web material, said cavity being defined by a housing having a longitudinal opening to which web material is fed, the width of said longitudinal opening being substantially greater than the width of the longitudinal seam to be made,

stopping said step of feeding prior to completion of a complete 360° preform to provide a partially wrapped preform,

holding said partially wrapped preform against the mandrel to fix the position of the preform on the mandrel and to predetermine the circumferential position of the forward edge of said material on said mandrel,

folding the back edge of said web material through said longitudinal opening and over the forward edge of said material to complete the preform and to establish an overlapped longitudinal edge seam zone, and

indexing said rotatable disk to bring said complete preform to a sealing station,

sealing the overlapped longitudinal edges to each other to form the seal and complete the cylindrical body,

repeating said steps of feeding, stopping, holding and folding on a second one of said cylinder forming units while the cylindrical body of said first one of said cylinder forming units is being sealed and completed.

3. Apparatus for fabricating a flexible cylinder from flexible web material comprising:

a housing having a cylindrical cavity defined by a cylindrical sidewall, said housing having a longitudinal opening through said sidewall into said cavity, said opening extending over a substantial arc of the cylinder defined by said cavity, said sidewall extending over the major portion of said cylinder, said longitudinal opening having a length adapted to receive the web material,

a cylindrical mandrel mounted within said cavity, the diameter of said mandrel being less than the diameter of said cavity to provide clearance between the surface of said mandrel and said sidewall, said clearance being slightly greater than the thickness of the web material to be used, said clearance being large enough to assure ready passage of the web material between said mandrel and said sidewall and being small enough to assure the formation of an essentially uniform and circular cylindrical body from said web material,

a feed roller movable between a drive position and a neutral position, said feed roller when in said drive position extending through an opening of said housing to feed a segment of web material into said space between said mandrel and said sidewall to form a partially wrapped preform and to press whatever web material is fed through said longitudinal opening in said housing against said mandrel, said feed roller retracting to said neutral position when said preform is partially wrapped a predetermined amount,

a seam presser movable between a holding position and a neutral position, said seam presser when in said holding position extending through said longitudinal opening in said housing, said seam presser moving from said neutral position to said holding position after said feed roller has retracted to said neutral position and when moving from said neutral position to said holding position contacting the trailing longitudinal edge portion of said web material and folding it down over the leading longitudinal edge portion of said web material to complete the wrapping of said preform about said mandrel, said seam presser when in said holding position holding overlapped longitudinal edges of said web material together under pressure against said mandrel thereby defining a seam for the cylinder to be formed, said arc to said longitudinal opening being sufficient to accommodate the seam presser and to receive the trailing edge portion of said web as it is folded down, and

at least one snubber movable between a holding position and a neutral position, said snubber when in said holding position extending through an opening in said housing to contact whatever web material has been fed between said mandrel and said sidewall to hold said web material in a predetermined position relative to said mandrel and said housing, said snubber moving from its neutral position to its holding position prior to said seam presser moving from its neutral position to its holding position.

4,310,370

PROCESS FOR PRODUCING DECORATIVE ARTICLES

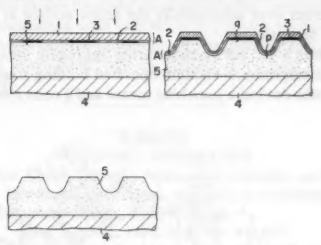
Eisuke Arai, Urawa; Fumio Takagi, Tokyo; Yasuaki Ishii, Matsudo, and Kuniaki Kamei, Kodaira, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1979, Ser. No. 81,354

Claims priority, application Japan, Oct. 6, 1978, 53-123311

Int. Cl.³ B05D *3/00, 5/02;* **B32B** *3/30*

U.S. Cl. 156—220 **19 Claims**



1. A process for producing decorative articles having patterns of surface concavities and convexities, which comprises the steps of:

(1) placing into mutual contact and laminating a deformable layer of hardenable decorative material and an expansion-contraction deformable sheet provided with first regions susceptible to expansion-contraction deformation, said sheet further provided with second regions not susceptible to said deformation, or third regions whose degree of susceptibility to said deformation differs from that of said first regions, or a combination of said second and third regions;

(2) causing the deformable sheet to undergo said deformation, thereby to impart a pattern of concavities and convexities corresponding to the regions provided on the deformable sheet to the surface of the decorative material layer in contact with the sheet;

(3) pressing the surface of the deformable sheet which is not in contact with the deformable layer with sufficient pressure to flatten the tops of the convexities and accentuate the margins between the convexities and the concavities before the deformable layer has fully hardened; and

(4) causing the hardenable decorative material layer to fully harden.

4,310,371

PROCESS FOR THE MANUFACTURE OF A JACKET FOR A FLEXIBLE DISK FOR DATA RECORDING

Hans Appoldt, Neuried; Werner Wagner, Oberkirch; Karl Hauck, Maxdorf, and Reinhold Baur, Offenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 15, 1979, Ser. No. 66,553

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1978, 2842185

Int. Cl.³ B32B *31/00;* **B65C** *9/04;* **B31F** *5/00;* **B65D** *85/00*

U.S. Cl. 156—227 **4 Claims**

1. A process for the manufacture of jackets for flexible magnetic data recording discs, each said jacket on each side thereof comprising a cover of a first material with a lining of a second, non-woven material and being formed by joining a sheet of said first material and a sheet of said second material together, punching the joined sheets out to form a composite blank having longitudinally thereof two substantially mirror-image sections with openings for permitting the disc to be operated within the completed jacket, and folding said composite blank, said process comprising:

providing a first manufacturing aggregate means including a first step-wise rotatably movable assembly carrier having

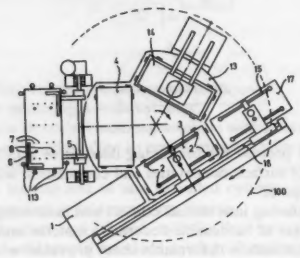
a plurality of stations, and first and second transfer devices each having vacuum operated gripping means,

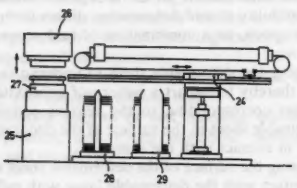
placing by means of said first transfer device a sheet of said first material from a stack of said sheets on said carrier at a first of said stations,

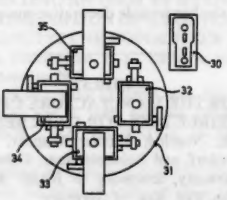
placing by means of said second transfer device a sheet of said second material on top of, and spot welding said second-material sheet to, said first-material sheet at a second of said stations, and

thermally welding said first- and said second-material sheets together over substantially the entire surface at a third of said stations;

providing a second manufacturing aggregate means including a magazine, a vacuum operated holding frame, a third transfer device, a punching means and a conveying means,







stacking the welded sheets in said magazine,

transferring the welded sheets, by means of said third transfer device, from said magazine to said holding frame, and

moving said holding frame with the welded sheets therein, with the aid of said conveying means to said punching device for forming said composite blank; and

providing a third manufacturing aggregate means including a second step-wise rotatably movable assembly carrier having a plurality of index positions and having pivotally mounted means and heating and cooling means,

folding with the aid of said pivotally mounted means and of a folding blade, one of the mirror image sections of the composite blank over on the other section, and

stabilizing folded areas with the aid of said heating and cooling means.

4,310,372

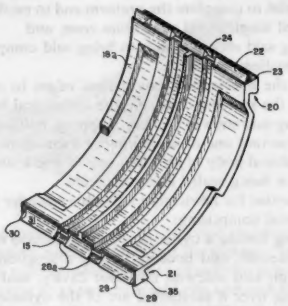
METHOD OF MAKING A WELL SCREEN

Kermit W. Janssen, Valley Forge, Pa., and Andrew Mitchell, Pompano Beach, Fla., assignors to Certain-Teed Corporation, Valley Forge, Pa.

Filed Apr. 19, 1979, Ser. No. 31,522

Int. Cl.³ B29C *27/02*

U.S. Cl. 156—245 **4 Claims**



1. A method of manufacturing a well screen, comprising:

injection molding from synthetic resinous material a curved section of the screen having a transverse extent of substantially 120° and with a plurality of integrally formed, inwardly extending radial ribs and an exterior continuous skin and including interfitting means disposed along the side surfaces of the sections that are designed to interfit with corresponding means on the side surfaces of two adjoining sections so that three sections can be interlocked to form a round configuration when drawn up tightly;

interfitting longitudinal side surfaces of three of the curved sections to form a substantially circular screen;

drawing mating side surfaces tightly together and welding them to interlock said sections; and

forming apertures of predetermined size in the skin in regions bounded by the radial ribs.

4,310,373

METHOD FOR HEAT-SEALING TEXTILE MATERIALS WITH POLYURETHANE ADHESIVES

Günter Schuhmacher; Erich Fahrbach, both of Weinheim, and Sepp Wagner, Gorxheimertal-Trösel, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Feb. 8, 1980, Ser. No. 119,954

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1979, 2906091

Int. Cl.³ B32B *31/20*

U.S. Cl. 156—308.2 **28 Claims**

1. A method for heat-sealing planar textile materials which comprises:

(a) applying a heat-seal adhesive in the form of a spun-bonded fabric to a polyurethane coated fabric; and

(b) pressing said spun-bonded adhesive and polyurethane coated fabric together under heat and pressure to heat-seal said spun-bonded fabric to said polyurethane coated fabric; wherein

(c) said heat-seal adhesive is a polyurethane which melts below about 150° C., prepared by reacting a solvent-free mixture of at least one diisocyanate, polybutylene glycol-ethylene glycol-adipic acid polyester having a molecular weight of about 1,000 to about 2,000 and an hydroxyl number of about 56, and a mixture of three diols comprising neopentyl glycol, diethylene glycol and 1,4-butane diol; and in the ratio of isocyanate to hydroxyl groups of the reactants in said reaction mixture times 100 being from

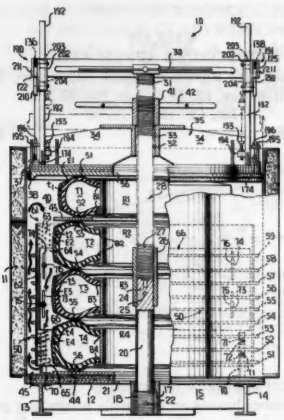
about 96 to about 100; and said heat-seal adhesive has a melting range which is below about 125° C.

4,310,374

TIRE RETREADING MACHINE

Kenneth T. MacMillan, Macon, Ga., assignor to Donald MacMillan & Son, Inc., Macon, Ga.

Filed Jun. 16, 1980, Ser. No. 159,496
Int. Cl.³ B29H *17/36*
U.S. Cl. 156—394 FM **24 Claims**



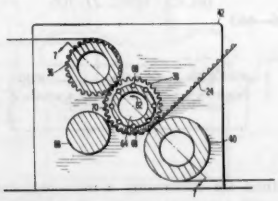
1. A tire retreading machine including means for defining a chamber adapted to receive therein a tire to be retreaded, said chamber including an inner surface from which a tire periphery is spaced when being disposed in the chamber during a retreading operation, means for heating the interior of said chamber, and means for establishing generally continuously circulating hot air convection currents within said chamber flowing generally upwardly adjacent said chamber inner surface and flowing generally downwardly more remotely inward from said chamber inner surface than the upwardly flowing currents.

4,310,375

LOWER CORRUGATING ROLL IN A SINGLE FACER

Yukuharu Seki, Takehare, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1979, Ser. No. 81,470
Claims priority, application Japan, Oct. 5, 1978, 53-137080[U]; Oct. 6, 1978, 53-123361
Int. Cl.³ B31F *1/10, 1/26*
U.S. Cl. 156—462 **11 Claims**



1. In a single facer including an upper corrugating roll, a lower corrugating roll having a hollow interior and having flutes extending longitudinally along its outer peripheral surface, and a pressure roll, the improvement comprising:

(a) a plurality of grooves in the outer peripheral surface of the lower corrugating roll, said grooves being spaced at intervals along said lower corrugating roll and encircling said lower corrugating roll transversely of said flutes;

(b) a plurality of circumferentially spaced bores in said lower corrugating roll between said hollow interior and said peripheral surface, said bores extending through one end surface of said lower corrugating roll and extending substantially the full length of said lower corrugating roll, said bores intersecting said grooves to provide communication with said peripheral surface of said lower corrugating roll; and

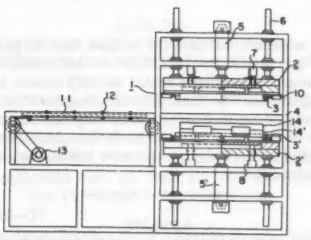
(c) suction means disposed adjacent said one end surface and communicating with said bores to provide suction at said peripheral surface of said lower corrugating roll to maintain a corrugated web in contact with said peripheral surface.

4,310,376

WELDING APPARATUS

Ryuzo Ebina, Chiba; Tsutomu Nakayama, Matsudo, and Minoru Tanaka, Kawasaki, all of Japan, assignors to Mitsubishi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1980, Ser. No. 121,037
Claims priority, application Japan, Feb. 20, 1979, 54-18793
Int. Cl.³ B29C *27/06;* B30B *5/06*
U.S. Cl. 156—499 **14 Claims**



1. A welding apparatus comprising:

a pair of opposing press plates relatively movable toward and away from each other, each of said plates supporting a molded article to be welded together;

a heating plate movable into and out of a space between said molded articles for fusing confronting surfaces of said molded articles so that said molded articles are welded together by applying pressure thereto by said press plates

a plurality of mold frames mounted on said press plates, at least one of said mold frames having an outwardly inclined inner surface, said mold frames defining an opening having substantially the same contour as said molded articles to be welded together and having a slightly smaller size than said molded articles; and

means supported by said press plates for separating said molded articles from said press plates.

4,310,377

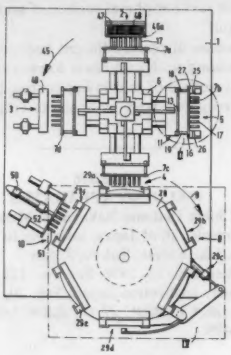
MACHINE FOR THE MANUFACTURE OF BRUSHES

Reinhold Lorenz, Voehl-Oberorke, Fed. Rep. of Germany, assignor to Schlesinger GmbH & Co. Maschinenbau KG, Frankenberg-Eder, Fed. Rep. of Germany

Continuation of Ser. No. 16,136, Feb. 28, 1979, abandoned. This application Dec. 15, 1980, Ser. No. 216,733
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1978, 2808965
Int. Cl.³ A46D *3/04;* A46B *3/00*
U.S. Cl. 156—499 **15 Claims**

1. In a machine for the manufacture of brushes, comprising a series arrangement of a bristle collecting station, a melting station and a welding station, and at least one bristle bunch holder, which consists of a plate having plural hollow bristle

holding sleeves thereon and comprising movement devices, with which said bristle bunch holder is successively aligned with each of said stations, the improvement comprising ejector means, a discharge station arranged in said series arrangement and preceding said bristle collecting station, said discharge station having ejector activating means for effecting, during advancement of said bristle bunch holder, a movement of said ejector means through all of said bristle holding sleeves to eject



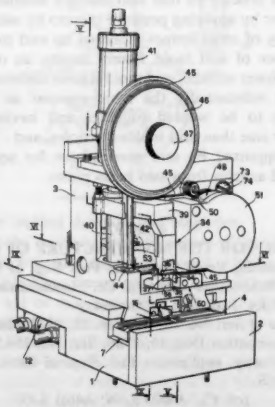
all bristle material that may be lodged therein prior to the arrival of said bristle bunch holder at said bristle collecting station, a magazine arranged in said welding station, said magazine having at least one stand with holding bars for holding a stacked array of brush heads, a removing station in which is provided a holder for the second to the lowermost brush head, and removing means for the lowermost brush head, which has bristles secured thereto.

4,310,378

TAPE SPLICING MACHINE, IN PARTICULAR FOR MAGNETIC TAPES FOR LOADING INTO CASSETTES

Angelo Bosco, San Donato Milanese, Italy, assignor to AEG-Telefunken Societa Italiana per Azioni, Milan, Italy

Filed Mar. 7, 1980, Ser. No. 128,311
Claims priority, application Italy, Mar. 12, 1979, 20910 A/79
Int. Cl.³ B31F *5/06*; B65H *69/06*
U.S. Cl. 156—506 **4 Claims**



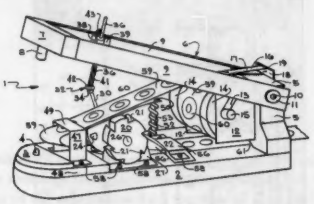
1. A tape splicing machine, in particular for magnetic tapes for loading into cassettes, comprising means for intermittently feeding adhesive tape in a continuous roll to an alternately sucking and blowing mobile head provided with cutting means for separating individual pieces of adhesive tape from said continuous roll, wherein said adhesive tape feed means comprise a grooved wheel which is partly wrapped by the adhesive tape with the non-adhesive side of the tape engaging the wheel, and an alternately sucking and blowing mobile support and guide element which is engageable with the adhesive side of the tape to support the portion of adhesive tape situated between the grooved wheel and the head, and is controlled such that it makes periodic movements towards the head in order to convey said portion of adhesive tape into a suitable position below the head for engagement by said head.

4,310,379

REINFORCER APPLICATOR

John P. Harrison, 261 Peyton-Conquitt, Shreveport, La. 71115

Filed Nov. 13, 1979, Ser. No. 93,379
Int. Cl.³ B65C *11/00*
U.S. Cl. 156—541 **10 Claims**



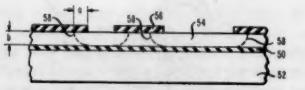
1. A reinforcer applicator comprising:
(a) a base member having an upwardly projecting guide peg;
(b) a beam having a pair of arms in spaced, parallel relationship to each other, with one end of each of said arms pivotally mounted to said base member;
(c) hollow press means projecting downwardly from the free end of said beam and in arcuate alignment with said guide peg;
(d) a tape supply drum rotatably mounted on said base member to receive a tape carrying a supply of gummed reinforcers in spaced relationship and having perforations extending through said tape; and
(e) drum and ratchet means cooperating with said beam and said tape to advance said tape and sequentially deposit said gummed reinforcers in registration with said guide peg responsive to depression of said beam.

4,310,380

PLASMA ETCHING OF SILICON

Daniel L. Flamm, Chatham Township, Morris County; Dan Maydan, Short Hills, and David N. Wang, Warren Township, Somerset County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 7, 1980, Ser. No. 138,083
Int. Cl.³ H01L *21/306*
U.S. Cl. 156—643 **6 Claims**



1. A method for fabricating a microminiature device in accordance with a process sequence that includes at least one step in which a silicon surface of the device is to be etched with high selectivity relative to other surfaces of the device in a dry etching apparatus that comprises a plasma established between anode and cathode electrodes one of which electrodes holds the device to be etched, the plasma resulting from imposition of an electric field across a gaseous environment introduced

between said electrodes, CHARACTERIZED IN THAT the gaseous environment comprises a fluorine-containing gaseous compound that provides in said apparatus under the influence of said electric field silicon-etching fluorine species and reaction products that do not etch said other surfaces of said device to any substantial extent relative to the etching of said silicon surface, wherein said gaseous compound is selected from the group consisting of chlorine trifluoride, nitrogen trifluoride, bromine trifluoride and iodine trifluoride.

4,310,381

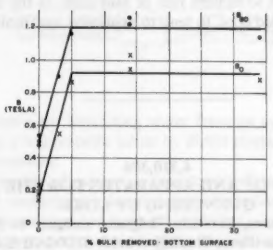
METHOD FOR IMPROVING MAGNETIC PROPERTIES OF METALLIC GLASS RIBBON

Nicholas J. DeCristofaro, Chatham, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 4, 1980, Ser. No. 137,344

Int. Cl.³ B22D *27/00*; C23F *1/00*

U.S. Cl. 156—664 **6 Claims**



1. A method for improving the magnetic properties of chill-block-cast, ferromagnetic metallic glass ribbon comprising substantially removing, prior to annealing, the regions of the ribbon surface that adjoined, but did not contact, the chill block during quenching.

4. The method of claim 1 in which the removal is accomplished by contacting at least the bottom surface of the ribbon with a chemical etchant liquid.

4,310,382

METHOD OF AND A DEVICE FOR VAPORIZING AND RECOVERING WATER FROM AQUEOUS SOLUTIONS

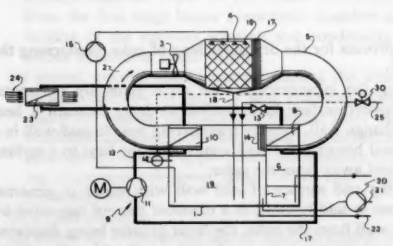
Manfred Gress, Berlin, Fed. Rep. of Germany, assignor to Schering AG, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jan. 21, 1980, Ser. No. 115,559

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1979, 2903008

Int. Cl.³ B01D *1/14*

U.S. Cl. 159—16 R **5 Claims**



1. A device for evaporating and recovering water from aqueous solutions, comprising a container for storing the solution; means defining a closed circulation channel communicating with the upper part of the container for conducting above the surface of the stored solution a stream of gas which is capable of absorbing moisture; a heat pump circuit, including a compressor for a heat transfer medium, a condensor arranged in said circulation channel to act as a heater for said circulating gas stream, an expansion valve and an evaporator arranged at another point in said circulation gas stream; a gas washing station including spraying means comprised of plural nozzles arranged in said circulation channel downstream of said condensor and upstream of said evaporator to expose the heated gas stream to a downwardly directed sprayed portion of the aqueous solution; condensate separating means arranged at the outlet of said evaporator to discharge condensed water content of said air stream; and means for transferring excessive heat energy not given off to said gas stream by said heat pump circuit, to an additional heat transfer medium for vaporizing additional amount of water.

4,310,383

CONTINUOUS COUNTERCURRENT PRETREATMENT OF LIGNOCELLULOSE WITH ANTHRAQUINONE PRIOR TO PULPING

John S. Fujii; William G. Whalley, both of Vancouver, and Fred L. Schmidt, Camas, all of Wash., assignors to Crown Zellerbach Corporation, San Francisco, Calif.

Continuation of Ser. No. 97,076, Nov. 23, 1979, abandoned. This application Nov. 10, 1980, Ser. No. 205,848

Int. Cl.³ D21C *3/02, 3/20, 11/00*

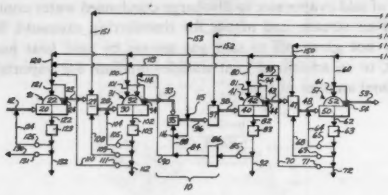
U.S. Cl. 162—37 **6 Claims**

1. A continuous process for pretreating lignocellulose with a quinone pretreatment agent wherein the pretreatment agent is recycled in the process, which process comprises continuously introducing the lignocellulose into one end of a tubular pretreatment zone and withdrawing it at the other end, continuously introducing an aqueous alkaline solution having an alkali concentration greater than 7 grams per liter of the solution into the pretreatment zone at the end at which the lignocellulose is withdrawn and withdrawing the aqueous solution at the end at which the lignocellulose is introduced wherein the pH of the aqueous solution withdrawn from the pretreatment zone is less than two pH units above the pKa of the reduced form of the pretreatment agent, maintaining in the pretreatment zone a concentration of the pretreatment agent of about 0.02 to 2.0 percent by weight based on the lignocellulose in the pretreatment zone, limiting the residence time of the lignocellulose in the pretreatment zone so that the lignin content of the lignocellulose is reduced not more than about 20%, establishing conditions at the end of the pretreatment zone at which the aqueous alkaline solution is introduced such that the pretreatment agent is substantially soluble in the aqueous alkaline solution, establishing conditions at the end of the pretreatment zone at which the aqueous solution is withdrawn such that the pretreatment agent is substantially insoluble in the aqueous solution, with the result that as the aqueous alkaline solution approaches the end of the pretreatment zone at which the aqueous solution is withdrawn, the pretreatment agent precipitates onto the lignocellulose which is introduced at the same end, and that as the lignocellulose flows through the pretreatment zone, the pretreatment agent is dissolved back into the aqueous alkaline solution, whereby the pretreatment agent is effectively recycled within the pretreatment zone, the pretreatment agent being anthraquinone or other compound having a quinone structure which promotes the delignification of lignocellulose.

4,310,384
REDUCING CHEMICAL TRANSFER BETWEEN TREATMENT STAGES

Michael D. Meredith, Federal Way, Wash.; Louis L. Edwards, Jr., and Keith T. Van Scotter, both of Moscow, Id., assignors to Weyerhaeuser Company, Tacoma, Wash.

Continuation of Ser. No. 2,492, Jan. 11, 1979, abandoned. This application Sep. 19, 1980, Ser. No. 189,389
Int. Cl.³ D21C 9/06, 9/10
U.S. Cl. 162—60 34 Claims

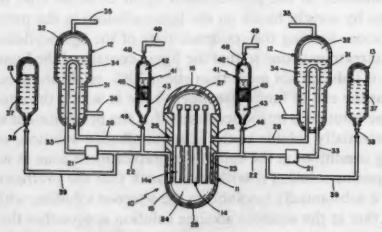


1. The process of reducing substantially the chemical transfer between pulp treatment stages comprising
forming a first pulp mat from pulp fibers and a first liquid phase,
applying a first fluid to said first pulp mat,
then applying a second fluid to said first pulp mat,
removing a first filtrate from said first pulp mat,
retaining within said first pulp mat a second liquid phase,
the maximum amount of said second fluid applied to said first pulp mat being substantially equal to said second liquid phase,
treating said pulp fibers with a chemical,
forming a second pulp mat from said pulp fibers and a third liquid phase,
applying a third fluid to said second pulp mat,
then applying a fourth fluid to said second pulp mat,
removing a second filtrate from said second pulp mat,
retaining within said second pulp mat a fourth liquid phase,
said third and fourth fluids applied to said second pulp mat being substantially equal to said fourth liquid phase, and
reusing at least a portion of said second filtrate as said second fluid.

4,310,385
EMERGENCY DEPLOYABLE CORE CATCHER

Michael P. Rosewell, 5155 S. Natchez Ave., Chicago, Ill. 60638

Filed Jan. 3, 1980, Ser. No. 109,247
Int. Cl.³ G21C 9/00
U.S. Cl. 376—280 13 Claims

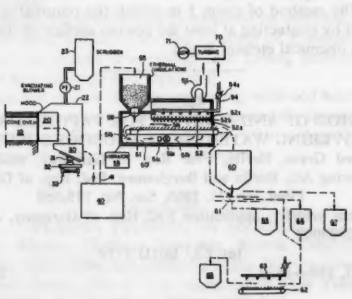


1. An emergency deployable core catcher for a nuclear reactor core containment vessel having predetermined pressure and temperature ranges for normal safe operation and adapted to pass coolant therethrough comprising particulate holding vessel having an internal pressure less than said pressure of said core containment vessel but greater than the pressure outside said core containment vessel for normally containing substances therein, said holding vessel outside said core containment vessel and being connected to said core containment vessel to allow the transfer of said substances into said vessel, said holding vessel substances including particle transferring fluid and particles of solid eutectic solute material to be transferred by said fluid, said solid particle material being heavier than said transferring fluid, and valve means operable with said holding vessel to normally prevent passage of said contents of said holding vessel into said core containment vessel and being responsive to a predetermined pressure differential between said core containment vessel and said holding vessel wherein said core containment vessel pressure is less than said holding vessel pressure to cause the release of the contents of said eutectic solute holding vessel into said core containment vessel, whereby said solid material will tend to settle out of said transporting fluid by sedimentation in the bottom of said core containment vessel beneath said core, as said holding vessel contents pass through said core vessel, forming a body of material in the bottom of said core vessel to catch and react to molten fuel of said core, in the event of a melt down of said core, to tend to neutralize said molten fuel of said core.

4,310,386
METHOD OF AND APPARATUS FOR THE DRY QUENCHING OF COKE

Theophile Martens, Ertvelde, Belgium, assignor to Siderurgie Maritime (Maritieme Staalnijverheid) SIDMAR S.A., Ghent, Belgium

Filed Jun. 9, 1978, Ser. No. 914,082
Claims priority, application Luxembourg, Jun. 14, 1977, 77536
Int. Cl.³ C10B 39/10, 39/12, 39/16, 57/00
U.S. Cl. 201—39 5 Claims



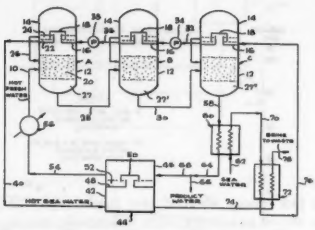
1. A process for the dry quenching of coke, comprising the steps of:
passing the incandescent coke on a generally horizontal transport surface in a continuous layer beneath a heat exchange wall, thereby transferring heat to said wall in a closed housing, the wall conducting the heat to a surface turned away from the coke;
spraying said surface of said wall with water to generate steam in said housing in a chamber thereof separated by the wall from the coke, the layer of coke being displaced on a continuous transport band beneath said wall and said wall forming a vault overlying said band;
displacing the particles of coke on the band during their passage beneath the vault; and
at least toward the end of the passage of the coke layer beneath the vault, passing an inert gas through the layer upwardly in the direction of said vault.

4,310,387

PROCESS AND SYSTEM OF DESALINATION BY DIRECT CONTACT HEAT TRANSFER

Pasupati Sadhukhan, La Verne, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Division of Ser. No. 907,143, May 17, 1978, Pat. No. 4,238,296.
This application Feb. 25, 1980, Ser. No. 124,437
Int. Cl.³ C02F 1/06
U.S. Cl. 202—175 9 Claims



1. A system for separating water from an aqueous solution containing a non-volatile solute by direct contact heat transfer which comprises:

(a) a plurality of unitary evaporator-condenser stages, each stage comprising a lower evaporator chamber, an upper condenser chamber means for enabling vapor to pass from said lower evaporator chamber into said upper condenser chamber and means for enabling condensate to pass from said upper condenser chamber into said lower evaporator chamber;

(b) means for introducing hot water into the lower evaporator chamber of a first stage of said evaporator-condenser stages and into contact with an immiscible liquid therein to cause boiling of said immiscible liquid to form a vapor therefrom;

(c) first conduit means, interconnecting the lower evaporator chamber of each of said evaporator-condenser stages, for passing said hot water from the evaporator chamber of said first evaporator-condenser stage to the evaporator chambers of succeeding stages to the evaporator chamber of a last stage of said evaporator-condenser stages, said hot water contacting an immiscible liquid in each of said lower evaporator chambers and causing boiling therof to form a vapor therefrom;

(d) means for introducing an aqueous solution containing a non-volatile solute into the upper condenser chamber of the last stage of said evaporator-condenser stages and into contact with the vapor of the boiled immiscible liquid from the first stage lower evaporator chamber to cause heating of the aqueous solution and condensing of the boiled immiscible liquid vapor;

(e) second conduit means interconnecting the upper condenser chambers of each of said evaporator-condenser stages for passing said aqueous solution from the upper condenser chamber of the last evaporator-condenser stage successively into the upper condenser chamber of preceding evaporator-condenser stages to the first evaporator-condenser stage;

(f) a flash chamber;

(g) means for withdrawing heated aqueous solution from the upper condenser chamber of said first evaporator-condenser stage and introducing said withdrawn heated aqueous solutes into the flash chamber for flashing vapor therefrom;

(h) means for condensing the flashed water vapor, and,

(i) means for withdrawing said condensed water as product.

4,310,388

ISOLATION OF A CONJUGATED DIOLEFIN FROM A C_4- OR C_5 HYDROCARBON

Klaus Volkamer, Frankenthal; Klaus Broellos, Seeheim; Alfred Lindner, Bobenheim-Roxheim; Ulrich Wagner, Limburgerhof; Hans-Martin Weitz, Bad Duerkheim, and Klaus-Jürgen Schneider, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 3, 1980, Ser. No. 126,898
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911395
Int. Cl.³ B01D 3/40; C07C 7/08
U.S. Cl. 203—51 2 Claims

1. A process for isolating a conjugated diolefin from a C_4- or C_5-hydrocarbon mixture containing the diolefin by extractive distillation using a selective solvent, wherein the selective solvent is a solvent mixture which comprises

(a) from 80 to 97 percent by weight of dimethylformamide, diethylformamide, dimethylacetamide, diethylacetamide, formylmorpholine, N-methylpyrrolidone, butyrolacetone or methoxypropionitrile and

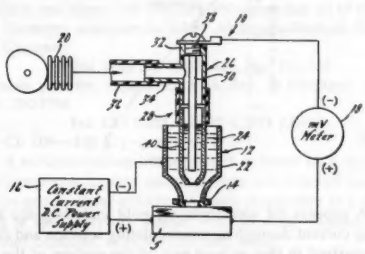
(b) from 3 to 20 percent by weight of acetonitrile, said solvent mixture containing at most 5 percent by weight of water, based on the solvent mixture.

4,310,389

METHOD FOR SIMULTANEOUS DETERMINATION OF THICKNESS AND ELECTROCHEMICAL POTENTIAL IN MULTILAYER PLATED DEPOSITS

Edward P. Harbulak, Allen Park, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 16, 1980, Ser. No. 159,547
Int. Cl.³ G01N 27/02, 27/26
U.S. Cl. 204—1 T 3 Claims



1. A method for measuring the thickness of individual layers of a multilayer electrodeposit while simultaneously measuring the electrochemical potential difference and determining the polarity between said layers comprising the steps of:

A. placing an anodic sample of known area of said multilayer electrodeposit, a cathode, and a reference electrode in contact with an electrolyte solution;

B. passing a constant direct current through said sample, said cathode, and said electrolyte solution;

C. measuring the potential between each layer of said sample and said reference electrode as a function of time and computing therefrom the thickness of said individual layers using Faraday's Laws; and

D. simultaneously with said measuring step, observing and computing the electrochemical potential difference between said layers and observing the polarity of the layers with respect to each other.

4,310,390
PROTECTIVE COATING PROCESS FOR ALUMINUM AND ALUMINUM ALLOYS

Robert E. Bradley, Temple, Ga., and William R. Keithler, Florissant, Mo., assignors to Lockheed Corporation, Burbank, Calif.

Continuation of Ser. No. 7,468, Jan. 26, 1979, abandoned, which is a continuation of Ser. No. 823,331, Aug. 10, 1977, abandoned. This application Jun. 27, 1980, Ser. No. 163,821

Int. Cl.³ C25D *11/24*

U.S. Cl. 204—37 R **7 Claims**

1. A protective coating process for aluminum and aluminum alloy components comprising the steps of:

anodizing the component to be coated;

applying a coating composition comprising a water soluble acrylic polymer or copolymer and a nitrogenous cross-linking agent to the anodized component at a temperature in the range of approximately 170° F. to 200° F. for a period ranging from about 30 to 60 minutes, the time and temperature being inversely related whereby said composition seals the anodized component through hydration and simultaneously primes the anodized component providing a surface coating capable of being cross-linked during a subsequent curing operation; and

curing the sealed and primed component at a temperature in the range of approximately 200° F. to 500° F. for approximately 1 to 60 minutes, the time and temperature being inversely related.

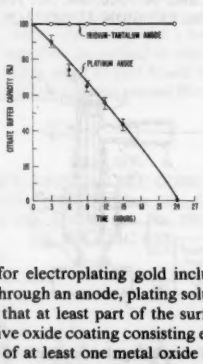
4,310,391
ELECTROLYTIC GOLD PLATING

Yutaka Okinaka, Madison, and Craig G. Smith, North Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 21, 1979, Ser. No. 105,977

Int. Cl.³ C25D *3/48, 3/56, 3/62, 17/10*

U.S. Cl. 204—46 G **7 Claims**



1. A process for electroplating gold including the step of passing current through an anode, plating solution and cathode characterized in that at least part of the surface of the anode comprises an active oxide coating consisting essentially of 15 to 90 mole percent of at least one metal oxide from group eight metals, said group eight metals selected from the group consisting of iridium and rhodium, remainder tantalum oxide.

4,310,392
ELECTROLYTIC PLATING

Paul A. Kohl, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 31, 1979, Ser. No. 108,964

The portion of the term of this patent subsequent to Apr. 21, 1998, has been disclaimed.

Int. Cl.³ G01N *3/38, 3/14, 3/22, 3/52*

U.S. Cl. 204—52 R **4 Claims**

1. A process for electroplating metallic substances consisting essentially of copper comprising the step of passing current through an anode, aqueous plating solution and cathode CHARACTERIZED IN THAT the plating bath comprises an heterocyclic additive consisting essentially of phenolphthalein.

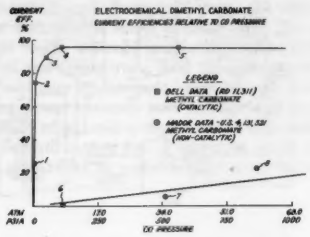
4,310,393
ELECTROCHEMICAL CARBONATE PROCESS

Robert A. Bell, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 29, 1980, Ser. No. 154,150

Int. Cl.³ C25B *3/10*

U.S. Cl. 204—59 R **13 Claims**



1. An electrochemical catalytic aliphatic carbonate process consisting essentially of contacting an alcohol, carbon monoxide, an effective amount of a Group VIIIB catalyst, an electrolyte containing a chloride, bromide or iodide ion and a direct electric current, subject to the proviso that the major product is the aliphatic carbonate.

4,310,394
PROCESS FOR PREPARING PEROXYDISULFATES OF ALKALI METALS AND AMMONIUM

Jean Malafosse, Sassenage, and Maurice Rignon, Champforgeuil, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation of Ser. No. 71,583, Aug. 30, 1979, abandoned. This application Jan. 15, 1981, Ser. No. 225,456

Claims priority, application France, Aug. 30, 1978, 78 24977

Int. Cl.³ C25B *1/28*

U.S. Cl. 204—82 **6 Claims**

1. In a process for preparing peroxydisulfates of alkali metals or ammonium by anode oxidation in a diaphragm electrolysis cell of aqueous solution of sulfate ions associated with protons, alkali cations or ammonium, the improvement wherein the active part of the diaphragm is a sulfonated polystyrene base cation exchange resin having a capacity of approximately 1.22 meq/g, supported by a polypropylene fabric, and said diaphragm being substantially impermeable to the persulfate anion $S_2O_8^=$.

4,310,395
PROCESS FOR ELECTROLYTIC RECOVERY OF NICKEL FROM SOLUTION

Rainer Huss, Kirchheim, and Werner Peters, Ostfildern, both of Fed. Rep. of Germany, assignors to SEP Gesellschaft fur technische Studien Entwicklung Planung mbH, Munich, Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,606

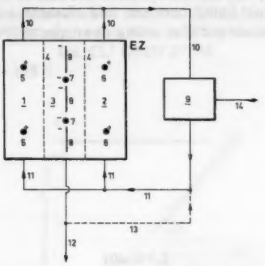
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1979, 2940741

Int. Cl.³ C25C *1/08*

U.S. Cl. 204—112 **9 Claims**

1. A method for the electrolytic recovery of metallic nickel from nickel sulfate-containing solution in an electrolysis cell having at least one cathode space with at least one cathode electrode therein, and at least one anode space with at least one anode electrode therein, said at least one anode space and said

at least one cathode space being separated from one another by a diaphragm, said method comprising extracting metallically pure nickel from said nickel sulfate solution by electrodepositing said nickel on moveable nickel electrodes disposed, along with fixedly positioned cathode electrodes for electrowinning



of nickel, in said at least one cathode space, and using said moveable nickel electrodes alternatively as anode electrodes and as cathode electrodes in selected ones of said anode and cathode spaces, repeatedly, while maintaining unchanged the polarity within said spaces.

4,310,396

METHOD FOR DESALINATION OF WATER, IN PARTICULAR SEA WATER

Georges Demairé, Bonnelles; Jacques Lys, Versailles, and Michel Berger, Meze, all of France, assignors to Societe d'Etudes et de Recherches en Sources d'Energie Nouvelles (SERSEN), Bonnelles, France

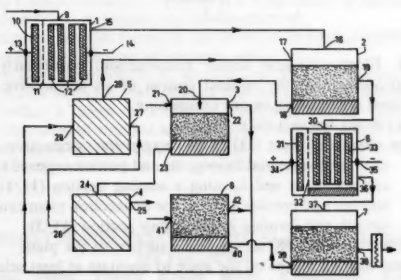
PCT No. PCT/FR79/00119, § 371 Date Jul. 31, 1980, § 102(e) Date Jul. 31, 1980, PCT Pub. No. WO80/01161, PCT Pub. Date Jun. 12, 1980

PCT Filed Nov. 30, 1979, Ser. No. 201,385

Claims priority, application France, Dec. 1, 1978, 78 34004

Int. Cl.³ C25B *1/28;* **C02F** *1/46*

U.S. Cl. 204—151 **5 Claims**



1. A method for desalination of sea water, brackish waters or brines, utilizing:

a main electrochemical generator consisting of one or more units including respectively a OH^- ion source cathode immersed in an electrolyte, a separator and an anode compartment through which the water to be desalinated flows in contact with an auxiliary electrode acting to collect the electric power produced by the generator,

a unit for removing the chlorates and perchlorates formed in the main electrochemical generator, by mixing a potassium salt with the solution to be desalinated, then settling, filtration and separation of the insoluble compounds obtained,

one or more additional electrochemical generators effecting removal of the alkaline and metal salts formed in the unit for removing chlorates and perchlorates, and using respectively a OH^- ion source cathode immersed in an alkaline electrolyte, a separator and an anode compartment through which the solution to be desalinated flows in contact with an auxiliary electrode acting to collect the electric power produced by said generators, as well as the cells for settling, filtrating and separating the thus obtained insoluble componds,

an auxiliary unit effecting recovery and decomposition of the various residual compounds obtained at the various desalination stages, and synthesis of the potassium salt used in the unit for removing the chlorates and perchlorates.

4,310,397

POLYMER COMPOSITION CONTAINING A PHYSIOLOGICALLY ACTIVE SUBSTANCE

Isao Kaetsu; Masaru Yoshida, and Masaharu Asano, all of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Feb. 12, 1980, Ser. No. 120,896

Claims priority, application Japan, Feb. 19, 1979, 54-017298

Int. Cl.³ C08F *2/48;* **A61K** *31/74, 31/78*

U.S. Cl. 204—159.22 **5 Claims**

1. A process for preparing a polymer composition containing a physiologically active substance which is released at a controlled rate, said process comprising contacting 10 parts, by weight, of at least one polymerizable monomer and 0.1 to 3 parts, by weight, of at least one physiologically active substance and irradiating them with light or an ionizing radiation while maintaining the system in an anhydrous condition and in an airless state such that in the produced polymer composition the physiologically active substance is capable of being released at a controlled rate.

4,310,398

SURFACE-COATING BINDERS AND THEIR USE FOR ELECTROCOATING FINISHES

Juergen Gimpel, Ludwigshafen; Heinrich Hartmann, Limburgerhof, and Hans-Uew Schenck, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 30, 1980, Ser. No. 155,125

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2924756

Int. Cl.³ C08L *63/08;* **C25D** *13/06*

U.S. Cl. 204—181 C **5 Claims**

1. A surface-coating binder which is based on a copolymer which contains tertiary amino groups and blocked isocyanate groups and is water-soluble or water-dispersible as a result of being at least partially salified with an acid, wherein the copolymer contains, as copolymerized units,

(A) from 6 to 22% by weight of one or more monomeric tertiary amino methacrylic or acrylic acid esters or acrylamides or methacrylamides containing a tertiary amino group,

(B) from 21 to 40% by weight of a monomeric adduct of an N-(1-alkenyl)-isocyanate, where 1-alkenyl is of 2 to 4 carbon atoms, and a CH-, OH- or NH-acidic blocking agent,

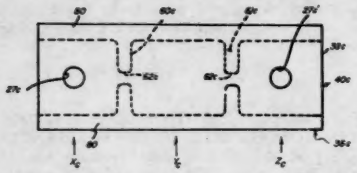
(C) from 0 to 35% by weight of one or more copolymerizable olefinically unsaturated compounds possessing hydrogen atoms which are reactive toward isocyanate groups and

(D) from 3 to 73% by weight of one or more copolymerizable olefinically unsaturated compounds not mentioned under (A) to (C), selected from the group consisting of esters of acrylic acid and methacrylic acid with monoalcohols of 1 to 18 carbon atoms, vinyl esters of carboxylic acids of 2 to 10 carbon atoms, vinylaromatics, acrylonitrile and unsaturated triglycerides, the copolymer having a mean molecular weight of from 1,000 to 20,000 and the percentages of (A) to (D) totaling 100.

4,310,399
LIQUID TRANSPORT DEVICE CONTAINING MEANS FOR DELAYING CAPILLARY FLOW

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 59,816, Jul. 23, 1979, abandoned. This application Dec. 10, 1979, Ser. No. 101,662
Int. Cl.³ G01N 27/30
U.S. Cl. 204—195 R 19 Claims

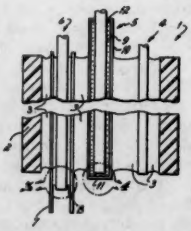


1. In a liquid testing device comprising
(a) two opposing surfaces which are spaced apart a distance effective to induce capillary flow of introduced liquid and to create a void zone of intended liquid transport, said zone comprising at least two distinct regions, at least one of which is a liquid analysis region, and
(b) means permitting introduction of liquid into said zone for capillary transport to said regions,
the improvement comprising gating means located between said two distinct regions for delaying capillary transport of liquid through said zone from one of said regions to other of said regions, said gating means including a gating wall extending across the intended path of liquid flowing from one of said regions to the other so as to delay liquid flow along said path, said wall including a gating aperture therein that is free of fibers.

4,310,400
THIN LAYER ELECTRODE AND CELL

Harry B. Mark, Jr., 6122 Dryden, Cincinnati, Ohio 45202; Andrzej Czerwinski, c/o Laboratory of Radio Chemistry Dept. Chemistry Warsaw University UL. Zwiarki, Wigury 101, 02-089 Warszawa, Poland, and Josip Caja, c/o Chemistry Dept. University of Sagreb, Sagreb, Yugoslavia

Filed Feb. 26, 1980, Ser. No. 121,687
Int. Cl.³ G01N 27/30
U.S. Cl. 204—195 M 18 Claims



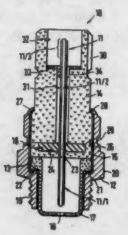
1. A thin layer electrode comprising an electroconductive element and an ion exchange membrane in spaced relation to said element, said membrane being positioned in relation to said element in such a manner so as to be capable of retaining a thin layer of investigate liquid between said element and said membrane, said membrane also acting as an electrolyte separator, and means to admit said investigate liquid between said membrane and said electro-conductive element.

6. A thin layer electrode cell comprising a working electrode, a reference electrode and an auxiliary electrode and a vessel for retaining said electrodes and an electrolyte wherein said working electrode and said reference electrode each consists of an electro-conductive element and an ion exchange membrane in spaced relation to said element said membrane being positioned in such a manner as to be capable of retaining a thin layer of liquid between said element and said membrane, means to admit liquid between said element and said membrane, said membrane also acting as an electrolyte separator.

4,310,401
ELECTROCHEMICAL SENSOR CONSTRUCTION ESPECIALLY AUTOMOTIVE-TYPE EXHAUST GAS ANALYZING SENSOR

Roland Stahl, Freiberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 27, 1980, Ser. No. 181,841
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1979, 2937048
Int. Cl.³ G01N 27/58
U.S. Cl. 204—195 S 8 Claims

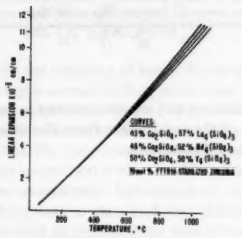


1. Electrochemical sensor construction, particularly for incorporation in the exhaust system of an automotive-type internal combustion engine comprising
a tubular housing (12);
an elongated plate (11) of an oxygen ion conductive solid electrolyte material having one end portion exposed to the exhaust gases and forming a sensing portion (11/1) and another end portion adapted for connection to an external circuit, and forming a connecting portion (11/3);
electrodes (37, 38) secured on a surface of the plate;
and heating means on the plate to maintain at least selected regions of the plate at an elevated temperature
comprising, in accordance with the invention
a seal (16) separating, in gas-tight manner, said sensing end portion (11/1) of the plate from the remainder of the plate and securing the elongated plate into the housing at an intermediate portion;
the portion of the sensor remote from said sensing end portion at the other side of the seal, and inwardly of the connecting portion (11/3) forming a reference portion (11/2) and being exposed to a reference substance;
and wherein one of the electrodes (37) is positioned on the measuring end portion and the other electrode (38) is positioned on the reference portion;
and wherein, further, said heating means comprises a flat heating layer applied to a surface of the plate opposite at least the electrode (38) on the reference portion (11/2).

4,310,402
GAS TIGHT SEALANT FOR ZIRCONIA SENSORS

Arnold O. Isenberg, Pittsburgh, and David F. Bradley, McKeesport, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 93,650, Nov. 13, 1979, abandoned, which is a continuation of Ser. No. 4,258, Jan. 18, 1979, abandoned. This application Nov. 5, 1980, Ser. No. 204,144
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—195 S 3 Claims



1. In a gas-sensing apparatus having a zirconia solid electrolyte electrochemical cell sealed to a support member for measuring a gas constituent of interest at a temperature of approximately 600° C. or higher, the combination of:

a support member having a coefficient of thermal expansion approximating that of zirconia, and

a sealant composition having a coefficient of thermal expansion which is within a range of ±10% of the coefficient of thermal expansion of zirconia and a melting point at a temperature in excess of 1000° C., for sealing said zirconia solid electrolyte electrochemical cell to said support member, said sealant composition being selected from the following formulations:

(a) $La_2O_3.Al_2O_3$:approximately 50 mol% of each

(b) 40% La_2O_3.60% Al_2O_3.

3. In a gas-sensing apparatus having a zirconia solid electrolyte electrochemical cell sealed to a support member for measuring a gas constituent of interest at a temperature of approximately 600° C. or higher, the combination of:

a support member having a coefficient of thermal expansion approximating that of zirconia, and

a sealant composition of silicates and rare earth element oxides having a coefficient of thermal expansion which is within a range of ±10% of the coefficient of thermal expansion of zirconia and a melting point at a temperature in excess of 1000° C. for sealing said zirconia solid electrolyte electrochemical cell to said support member.

4,310,403
APPARATUS FOR ELECTROLYTICALLY TREATING A METAL STRIP

Hajime Nitto, Tokyo; Kango Sakai, Kitakyusyu; Yasuo Shimokawa, Fukuoka, and Katusi Saito, Kitakyusyu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

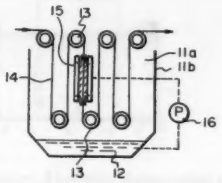
Filed Mar. 2, 1981, Ser. No. 239,478
Claims priority, application Japan, Mar. 7, 1980, 55-28025; Mar. 7, 1980, 55-28026
Int. Cl.³ C25D *7/06, 17/10*
U.S. Cl. 204—206 15 Claims

1. An apparatus for electrolytically treating a metal strip with an electrolyte, which comprises:

a vessel for defining an electrolytic treatment space for a metal strip;

a plurality of conductor rolls arranged along a path of movement of said metal strip extending through said treatment space;

at least one pair of electrode pads, each pair of electrode pads being located between two said conductor rolls and being spaced from and facing each other with said path of said steel strip therebetween, and each pad being provided with at least one slit through which an electrolyte is ejected toward the surface of said metal strip under conditions adquate for creating a static pressure of said ejected electrolyte sufficiently high for holding said metal strip in



its path in the gap between said electrode pad and said metal strip;

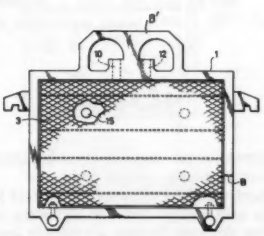
means for supplying said electrolyte to each slit, and;

means for applying voltage between at least one of said conductor rolls and said electrode pads.

4,310,404
ELECTROLYTIC BATH VESSEL ELEMENTS

Hiroaki Satoh, Tokyo; Yoshikazu Kokubu, Iwaki; Kiyoshi Kitagawa, Iwaki, and Isao Okazaki, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1979, Ser. No. 94,689
Claims priority, application Japan, Nov. 17, 1978, 53/141861
Int. Cl.³ C25B *9/00;* C08K *9/00, 7/02;* H01M *2/00*
U.S. Cl. 204—252 14 Claims



1. An electrolytic cell element comprising a frame structure partially defining an anode chamber and a cathode chamber, said frame structure being composed of a carbon fiber-polymer composite material wherein said polymer is polypropylene or a copolymer of polypropylene, the polymer being chemically modified with an organo-carboxylic acid to improve the affinity of said carbon fiber to said polymer.

4,310,405
DEVICE FOR THE PHOTOELECTROCHEMICAL GENERATION OF HYDROGEN AT P-TYPE SEMICONDUCTOR ELECTRODES

Adam Heller, Bridgewater, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

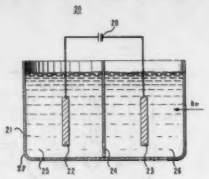
Filed Sep. 23, 1980, Ser. No. 190,017
Int. Cl.³ C25B *1/02*
U.S. Cl. 204—252 7 Claims

1. A device comprising a first electrode, a second electrode comprising a p-type semiconductor, a voltage source connected to said first and second electrodes, a liquid electrolyte, a separator in said electrolyte and forming first and second

electrode compartments having said first and second electrodes, respectively,

characterized in that

said electrolyte in said second compartment further comprises a redox couple selected from the group consisting of V^{2+}/V^{3+}, Nb^{4+}/Nb^{5+} and Ti^{3+}/Ti^{4+} cations and a hydrogen evolution catalyst selected from the group consisting of ruthenium, rhodium, palladium, platinum and compounds thereof.



4,310,406

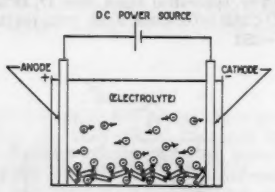
APPARATUS FOR REMOVING METAL IONS AND OTHER POLLUTANTS FROM AQUEOUS SOLUTIONS AND MOIST GASEOUS STREAMS

Avery B. Smith, Wallingford, and Mark J. Hayes, Sandy Hook, both of Conn., assignors to Resource Control, Incorporated, West Haven, Conn.

Filed Oct. 1, 1968, Ser. No. 764,255

Int. Cl.³ C25B *9/00*; C25C *7/00*; C02F *1/46*

U.S. Cl. 204—275 **9 Claims**



1. Apparatus for the removal of contaminants from aqueous fluids electrochemically, which comprises:

a treatment vessel for containing the fluid to be treated;

a bed in said vessel, said bed including solid particulate packing elements forming a media of low electrical conductivity;

at least two electrodes including a cathode and an anode in relation to said bed so as to be in direct contact with elements thereof and in spaced relation to each other in said vessel; and

means for connecting a source of direct electrical current to said electrodes to induce a potential difference between said electrodes across said bed and through said elements.

4,310,407

ELECTROPHORETIC APPARATUS

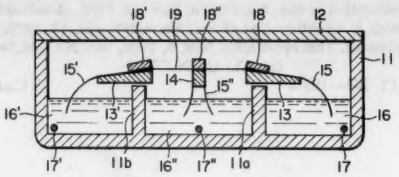
Nobutaka Kaneko, Hachiouji, and Shinichi Kamachi, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 21, 1980, Ser. No. 151,890

Int. Cl.³ G01N *27/28, 27/30, 27/26*

U.S. Cl. 204—299 R **8 Claims**

1. An electrophoretic apparatus comprising at least two electrode chambers filled with buffer solutions respectively, electrodes arranged in said electrode chambers respectively, three filter paper supports, and three members for supplying said buffer solutions and electric current which are mounted on said filter paper supports respectively and dipped at one end into the buffer solutions contained in said electrode chambers, and so adapted as to form electrophoretic patterns by electrically energizing a carrier on which sera are applied in two rows after placing said carrier on said members for supplying the buffer solutions and electric current in such a manner that the portions of the carrier free from the sera are brought into contact with said members.



4,310,408

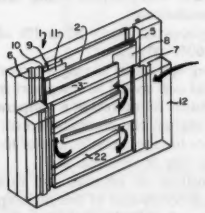
ELECTROPHORESIS CHAMBER

Alan L. Rose, and David W. Richman, both of St. Louis, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Feb. 20, 1980, Ser. No. 122,842

Int. Cl.³ G01N *27/26, 27/40*

U.S. Cl. 204—301 **13 Claims**



1. A chamber for conducting an electrophoretic process, comprising:

a buffer flow chamber including at least a pair of large surface area plates spaced from and positioned generally parallel to one another to define said buffer flow chamber;

buffer in said buffer flow chamber flowing in a first direction;

at least one coolant flow chamber adjacent said buffer flow chamber and in thermal contact therewith;

coolant buffer in said coolant buffer chamber;

a first electrode positioned along a first end of said parallel plates;

a membrane between said electrode and said buffer flow chamber, positioned in the same plane as and continuous with one of said parallel plates;

a second electrode positioned near a second end of said parallel plates; and

a second membrane interposed between said second electrode and said buffer flow chamber, positioned in the same plane as and continuous with the other of said parallel plates, said coolant flow chamber and said buffer flow chamber communicating with one another along said first and said second membranes.

4,310,409

THERMAL CRACKING OF HEAVY FRACTION OF HYDROCARBON HYDROGENATE

Hans J. Wernicke, Wolfratshausen; Walter Kreuter, Penzberg, and Claus Schliebener, Strasslach, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation of Ser. No. 82,453, Oct. 9, 1979, Pat. No. 4,260,474. This application Oct. 16, 1980, Ser. No. 197,377
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843792
The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.
Int. Cl.³ C10G 69/06
U.S. Cl. 208—57 3 Claims

1. In a process for the cracking of heavy liquid hydrocarbon feed mixtures having a normal boiling point over 200° C. and containing monoaromatics and polyaromatics by hydrogenation of said feed and subsequent thermal cracking of resultant feed to obtain olefins, the improvement comprising the hydrogenation step being conducted under conditions such that the polyaromatics are extensively hydrogenated, and wherein between the hydrogenation step and the thermal cracking stage, there is provided an intermediate step of separating the hydrogenation product into a (i) light fraction containing the major proportion of the monoaromatics and (ii) a heavy liquid fraction, said heavy liquid fraction being substantially less isomerized than said light fraction, and subjecting only said heavy liquid fraction to the thermal cracking stage to obtain a product stream rich in ethylene.

4,310,410

CRACKING PROCESS

Dwight L. McKay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 65,826, Aug. 13, 1979, Pat. No. 4,263,172. This application Jan. 28, 1981, Ser. No. 229,209
Int. Cl.³ C10G 11/02
U.S. Cl. 208—120 10 Claims

1. A process which comprises contacting a hydrocarbon feed containing contaminating metals with a cracking catalyst under cracking conditions to produce a gasoline fraction, the improvement which comprises contacting said catalyst with manganese selenide under conditions which are conducive to the deposition of manganese selenide on said catalyst in an amount sufficient to increase the octane rating of the gasoline produced.

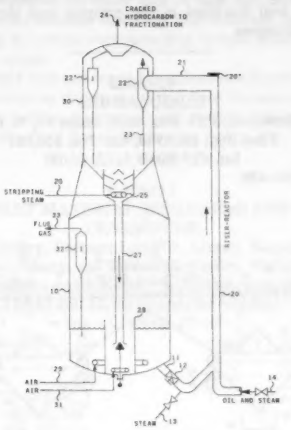
4,310,411

CATALYTIC CRACKING

Gregory C. Wilkening, West Columbia, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 932,890, Aug. 10, 1978, abandoned. This application Feb. 5, 1980, Ser. No. 118,833
Int. Cl.³ C10G 11/18
U.S. Cl. 208—153 9 Claims

1. An elongated transfer line catalytic cracking riser-reactor system comprising, in combination, a substantially vertical tubular cylindrical section having an inlet end connected to a catalyst regenerator and an oil inlet, a substantially horizontal tubular cylindrical section connected to the upper end of said vertical section and having an outlet end connected to a catalyst separator vessel for separation and return of catalyst to said regenerator and wherein the cross-sectional area of said vertical section of the reactor is less than the cross-sectional area of the horizontal section of the reactor which feeds the catalyst separator vessel so that the flow velocity in said horizontal section is somewhat less than said vertical section to substantially prevent and minimize erosion of the horizontal section and catalyst separator, said vertical section and said horizontal section being so sized that the ratio of the cross-sectional area of the vertical riser to the cross-sectional area of the horizontal section based on the average flow velocities in both



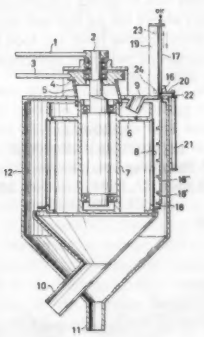
the vertical and horizontal sections ranges from at least about 0.5 up to about 1.

4,310,412

METHOD FOR CLASSIFICATION OF COALS FOR COKE PRODUCTION

Syozo Murakami; Hiroaki Yamanaka; Kazuhiro Yokoyama; Yasuhiro Yone, all of Himeji, and Tokuzi Yamaguchi, Kitakyushu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 7, 1979, Ser. No. 73,320
Claims priority, application Japan, Oct. 7, 1977, 52-120620
Int. Cl.³ B07B 1/20
U.S. Cl. 209—10 3 Claims

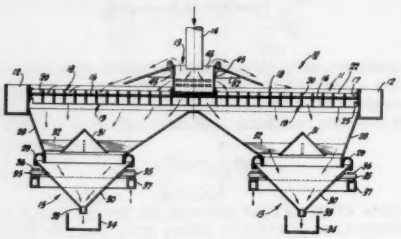


1. A method for classifying wet coal for coke production comprising:

supplying the wet coal into a cylindrical screen, rotating and revolving the screen in an almost vertical position to subject the wet coal to gravity, centrifugal force and vibrating force, blowing a high pressure gas stream against the outer side of the screen, and vertically moving the blowing position of the gas stream to clean the screen, while classification is being performed whereby the under-mesh and over-mesh coal fractions are obtained in a primary classification, grinding the over-mesh coal fraction after the primary classification, subjecting the ground over-mesh coal fraction to a secondary classification using

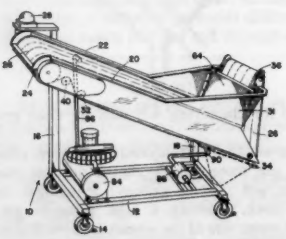
a screen mesh smaller than the screen mesh smaller than the screen mesh used in the primary classification, repeating the grinding and classification, and mixing the undermesh coal fractions in the primary and the secondary classifications.

4,310,413
CIRCULAR JIG
Norman Cleaveland, P.O. Box 4638, Santa Fe, N. Mex. 87502
Filed Jun. 16, 1980, Ser. No. 160,081
Int. Cl.[3] B03B *5/12, 11/00*
U.S. Cl. 209—456 7 Claims



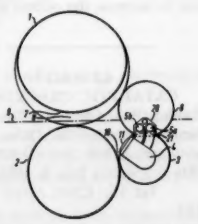
1. Apparatus for gravity separation of minerals comprising:
(a) a circular jig basket having an outer wall, a screen extending from the center of the basket to the outer wall and a grid structure superimposed on the screen into which heavy minerals may sink and pass through the screen, such grid structure and screen providing a jig bed,
(b) a jig feed box located centrally on the screen, the walls of such feed box having side openings above the screen through which pulp may flow onto the jig bed,
(c) aprons attached to the upper part of the jig feed box, extending radially outwardly therefrom and widening outwardly therefrom whereby the several aprons form a continuous flow surface over the part of the jig bed neighboring the feed box to direct the overflow from the feed box outwardly above the jig bed and then onto portions of the jig bed more remote from the feed box, and
(d) means for imparting pulsating movement to the jig bed to agitate pulp delivered thereto.

4,310,414
LIQUID SEPARATOR
O. Wade Lux, 90 Ridgeway Ave., Santa Rosa, Calif. 95406
Filed Mar. 27, 1981, Ser. No. 248,513
Int. Cl.[3] B01D *33/04*
U.S. Cl. 210—238 8 Claims



1. A machine for removing liquid from a slurry comprising:
a base;
a pair of spaced, generally parallel, interconnected beams;
at least one vertical support member secured between said base and just one of said beams for cantilever support of said pair of beams;
a drive roll and a plurality of idler rolls rotatably mounted between said beams;
an endless porous belt carried on, to be driven by, said rolls on a working run from a wet end to a dry end, and down and back on a return run back to said wet end;
a liquid collector tank supported between said beams and disposed between said working and return runs;
a vacuum conduit connected between upper portions of said tank and a source of vacuum;
a liquid drain from the lower portions of said tank; and
a belt tensioning roller journaled in brackets on said beams between a pair of said rolls;
one of said brackets being pivoted to one of said beams and the other of said brackets being releasably attached to the other of said beams;
said belt tensioning roller being conditioned to release tension on said belt enough to enable removal of same over said beams when said other bracket is released from said other beam.
6. The machine defined by claim 1 including:
scraper blades supported between said beams to engage said porous belt at at least some of said rolls in the initial stage of said return run.
7. The machine defined by claim 1 including:
a belt washer duct supported by said one beam and extending transversely across and above the return run of said belt downstream of said tank;
a plurality of ports along said washer duct to jet water on the inner surface of said porous belt; and
a reservoir disposed below said porous belt in the area of said belt washer duct.

4,310,415
ANTI-POLLUTION EQUIPMENT
Michael G. Webb, Wootton Bridge, England, assignor to The British Petroleum Company Limited, London, England
Filed Feb. 28, 1980, Ser. No. 125,517
Claims priority, application United Kingdom, Mar. 6, 1979, 7831/79
The portion of the term of this patent subsequent to Jun. 10, 1998, has been disclaimed.
Int. Cl.[3] E02B *15/04*
U.S. Cl. 210—242.3 4 Claims



1. A barrier for the containment and recovery of oil spilt on water, the barrier comprising a first elongate, flexible, buoyant, inflatable air chamber having a plurality of sections of reduced diameter; an elongate, flexible, inflatable ballast water chamber; an elongate, flexible oil and water discharge tube; a second elongate, flexible, buoyant, inflatable air chamber; the first air chamber, the ballast water chamber, the oil and water discharge tube and the second air chamber being joined together in side-by-side relationship; the chambers and the tube being so positioned relative to one another that, when in use on oil polluted water, the first air chamber and the ballast water chamber together form a barrier for oil spilt on water except in the sections of reduced diameter of the air chamber, these sections and the ballast water chamber defining a series of

weirs for oil and water to pass into a gallery; the gallery being formed by the ballast water chamber, the oil and water discharge tube and the second air chamber; the oil and water discharge tube being provided with means to remove oil and water from the gallery.

4,310,416

PLATE TYPE FLUID TREATMENT APPARATUS

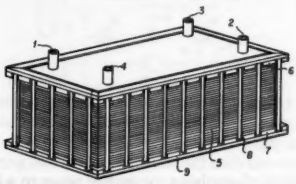
Yoshinobu Tanaka; Koichi Ogawa, and Minoru Hioka, all of Kurashiki, Japan, assignors to Kuraray Company, Limited, Kurashiki, Japan

Continuation of Ser. No. 935,001, Aug. 18, 1978, abandoned. This application Jul. 11, 1980, Ser. No. 168,809

Claims priority, application Japan, Aug. 19, 1977, 52-99830; Apr. 26, 1978, 53-50805; May 22, 1978, 53-69619

Int. Cl.³ B01D *13/00*

U.S. Cl. 210—321.3 **9 Claims**



1. A plate type fluid treatment apparatus comprising:

a plurality of stacked membrane support plates having a thickness not greater than 1.2 mm, each said membrane support plate having a face side and a reverse side, said plates being stacked in a stacking direction such that each of said face side of one of said plates faces the reverse side of an adjacent plate and each said reverse side faces the face side of an adjacent plate;

a single membrane interposed between each of said plates;

a first membrane supporting zone on a central portion of each said face side;

a second membrane supporting zone having a configuration different from that of said first membrane supporting zone on a central portion of each said reverse side;

first through fourth fluid manifold holes on the peripheral portions of each of said plates, said fluid manifold holes being aligned so as to form a manifold in said stacking direction;

inlet and outlet ports for each of said first and second fluids, said inlet and outlet ports respectively communicating with said fluid manifold holes on the peripheral portions of said plates;

first fluid introducing means in each said plate for introducing said first fluid from said first fluid manifold hole into the space between said first membrane supporting zone of each said plate and one of said membranes; and

second fluid introducing means in each said plate for introducing said second fluid from said second fluid manifold hole into the space between said second membrane supporting zone of each said plate and another of said membranes;

wherein said separate first and second fluid introducing means in each said plate prevent mingling of said fluids;

wherein each of said membrane support plates has a thickness at said membrane supporting zones of d=5 to 500μ, each first membrane supporting zone having a large plurality of projections thereon wherein d at least equals or is greater than the total volume of said projections divided by the area of said first membrane supporting zone, and each of said second membrane supporting zones being substantially flat; and

wherein each said membrane support plate comprises

a first member including said first and second membrane supporting zones, said manifold holes and fluid introducing means connecting said first and second membrane supporting zones with said first and second manifold holes; and

a second member on either side of said first member, each said second member including said manifold holes and an opening in a zone corresponding to said membrane supporting zones;

wherein said first and second members are located adjacent one another so that each of said fluid introducing means, together with a portion of said second member, form a tunnel-like fluid flow introduction path.

4,310,417

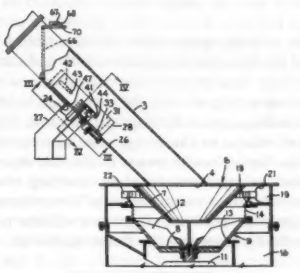
AIR INLET MATERIAL SEPARATOR FOR CHIP CENTRIFUGE

Robert H. Dudley, Portage; Larry D. Areaux, Texas Township, Kalamazoo County, and Russell D. Dudley, Vicksburg, all of Mich., assignors to Reclamet, Inc., Kalamazoo, Mich.

Filed Jul. 31, 1979, Ser. No. 62,502

Int. Cl.³ B01D *33/10*

U.S. Cl. 210—375 **23 Claims**



1. In a system for recovering the cutting tool liquid from a mixture of heavy, high mass density components, machine turnings, cutting chips and cutting tool liquids, said system including a negative air pressure generating centrifugal separator means for extracting liquids from the machine turnings and cutting chips, means for separating the heavy components prior to entry of the mixture into said centrifugal separator means, said means comprising: a feed conduit communicating with an inlet opening in said centrifugal separator means and being the only inlet opening communicating with the interior thereof, said conduit having a bottom wall, means limiting the quantity of air entering said feed conduit at its intake end whereby said centrifugal separator means maintains a negative air pressure throughout said conduit; an opening in said bottom wall of said conduit providing an intake of air at a higher pressure than that in said conduit creating an entering column of air at a velocity sufficient to entrain said machine turnings, cutting chips and the cutting tool liquids while permitting said heavy components to drop through said opening, said means limiting the quantity of air entering said feed conduit also effecting a major portion of said air to enter said conduit through said opening.

4,310,418

COOKWARE WITH DRAINAGE LID

Sylvia S. Busbey, 416 Crescent Dr., Mattoon, Ill. 61938

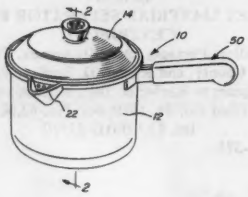
Filed Jun. 12, 1980, Ser. No. 158,921

Int. Cl.³ B01D *23/20*

U.S. Cl. 210—467 **1 Claim**

1. In a cooking pan having a bottom, an upstanding peripheral wall terminating in an upper edge, handle means on said wall to enable manipulation of the pan, said wall including a pouring spout incorporated into the upper portion of the wall with the lower end of the spout spaced above the bottom of the pan, a lid forming a closure for the pan, said lid including a

depending flange telescopically received within the wall of the pan is close fitting relationship thereto to form a closure for the pouring spout, said lid also including handle means fixed to the upper surface thereof to enable manipulation thereof, that improvement comprising the flange having a bottom edge extending to a point below the bottom edge of the pouring spout, said flange also including an imperforate portion and oppositely disposed perforated portions with the perforations in one of the perforated portions including a plurality of small circular holes and the perforations in the other perforated portion including a plurality of larger slot-like openings to



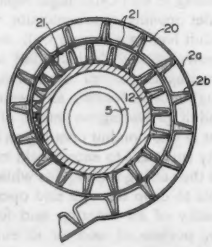
enable the pouring spout to be closed when an imperforate portion of the flange is aligned therewith and communicating the spout with the interior of the pan when one of the perforated portions is aligned with the spout, said handle means on the lid including oppositely disposed pictorial representations of the perforations in the flange, said representations being oriented on the lid handle means to the side thereof adjacent the perforations represented thereby enabling a user to angularly orient the lid to position either of the perforated portions or the imperforate portion is alignment with the pouring spout without actually observing the flange on the lid.

4,310,419

FILTER ELEMENT FOR LIQUID STRAINING FILTER

Akio Nara, and Hideaki Sasaya, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 29, 1981, Ser. No. 229,629
Claims priority, application Japan, Mar. 19, 1980, 55-35432
Int. Cl.³ B01D *29/06*
U.S. Cl. 210—493.4 **3 Claims**



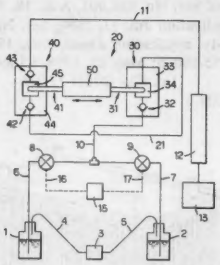
1. A filter element for straining liquid formed of a filter material, said filter material comprising two portions separated by a longitudinal center, one portion being a planar portion and the other portion being a corrugated portion including a plurality of elevated areas, said filter material being folded in half in the longitudinal center to form a series of letters V on a transverse cross-sectional surface thereof and the folded filter material being wound into a convoluted form, characterized in that the pitch of the elevated areas of the corrugated portion of the filter material wound into a convoluted form is increased from the central portion of the convoluted filter element to in the outer peripheral portion thereof.

4,310,420

MOBILE PHASE SUPPLYING METHOD IN THE LIQUID CHROMATOGRAPHY AND APPARATUS THEREFOR

Hideki Konishi, Tokyo; Michiaki Sugawara, Hachioji, and Muneo Saito, Tama, all of Japan, assignors to Japan Spectroscopic Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1980, Ser. No. 127,994
Claims priority, application Japan, Mar. 14, 1979, 54/29728
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—659 **8 Claims**



1. A method of supplying the mobile phase to a liquid chromatograph wherein said mobile phase consists of a predetermined mixture of a plurality of solvents each contained in separate reservoir means; providing valve means and controlling the flow of each solvent out of its reservoir means using said value means;

providing a first reciprocation type plunger pump to supply said mobile phase and a sample therein to a liquid chromatograph;

providing a second reciprocation type plunger pump to supply said mobile phase to the suction side of said first pump;

synchronously driving both said pumps to secure a supply of said mobile phase to the first pump by supplying the same amount thereof discharged by said second pump;

controlling said valve means such that all of said solvents are prevented from flowing into said second pump while said second pump is carrying out its discharging operation; and

controlling the second pump when it is carrying out its sucking operations of the solvents from each reservoir via said valve means according to a predetermined time ratio or according to a predetermined flow amounts ratio,

whereby said predetermined mixture of said plurality of solvents in said mobile phase comprises predetermined amounts of and predetermined kinds of said solvents to be sucked into said second pump.

4,310,421

REUSE OF WASTE WATER IN BATTERY MANUFACTURE

Jon K. West; Kenneth LeDuc, and Serge Ferrus, all of Gainesville, Fla., assignors to General Electric Company, New York, N.Y.

Filed Sep. 29, 1980, Ser. No. 192,153
Int. Cl.³ C02C *5/02*
U.S. Cl. 210—740 **10 Claims**

1. In a process of battery manufacture which includes the steps of washing a partially completed battery component with water and which includes a further step employing a sodium hydroxide solution, the improvement comprising the method of reusing waste water from said washing step, comprising the automatically effected steps of:

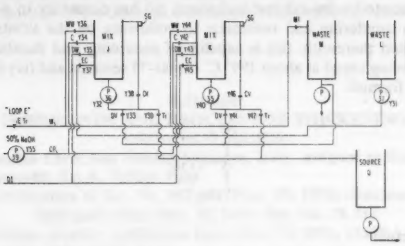
(a) transferring a determined quantity of said waste water to a mix tank;

(b) adding a determined quantity of a sodium hydroxide solution;

(c) circulating the contents of said mix tank for a predetermined time;

(d) monitoring specific gravity of said mix tank contents at least after circulating said mix tank contents for a predetermined time,

(e) selectively adding a further determined quantity of water or sodium hydroxide solution if said monitored specific gravity is not within a selected range, or



(f) transferring said mix tank contents to a source of battery treatment sodium hydroxide solution if said monitored specific gravity is within said selected range, and

(g) repeating said steps (e), (c) and (d) each time said step (d) indicates that said specific gravity is not within said selected range.

4,310,422

METHOD OF PROCESSING AND RECIRCULATING FILTRATION RESIDUES

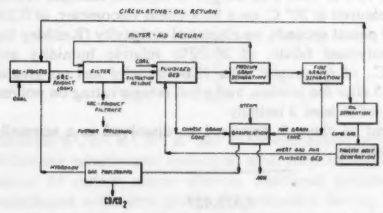
Ingo Romey, Hünxe, and Reinhard Pass, Essen, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 10, 1981, Ser. No. 233,103

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1980, 3005246

Int. Cl.³ B01D *41/00*

U.S. Cl. 210—769 **4 Claims**



1. A method of recovering and reusing filtration residue which develops during filtering of tars, pitches, coal extracts and coal oil with the help of filter aids, comprising the steps of passing an inert gas about and through the filtration residue until the residue becomes sufficiently dry to permit comminution; comminuting the dried residue to a particle size of about 0.5 mm; heating the comminuted residue particles in a fluidized bed to a temperature between about 500°–1200° C. at a heating rate of 1000° C./minute to thereby obtain a mix of expanded particles of different sizes; segregating from said mix a fraction containing particles in the size range of substantially 0.05–0.3 mm; and using the thus segregated fraction as a filter aid in the filtration of tars, pitches, coal extracts and coal oil.

4,310,423

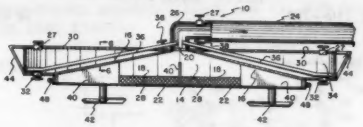
STREAM WATER PUMPING MEANS AND METHOD

Steven F. Brown, R.R. #2, Clearwater, Kans. 67026, and Harold F. Brown, 515 W. Shore, Wichita, Kans. 67209

Filed Dec. 26, 1979, Ser. No. 106,674

Int. Cl.³ B01D *29/38, 35/02*

U.S. Cl. 210—791 **8 Claims**



1. A process for removing water from a river, pond, or the like, that has a sandy base and/or moving or floating debris such as leaves, sticks, weeds, by a device having a cone shaped water intake chamber with a water intake opening and a water exit aperture, a base plate, a filtering means interconnecting the base plate the the base periphery of the roof of the water intake chamber, an air chamber circumscribing the roof of the water intake chamber, a cleaning water conduit attached to the device, a conduit filter cleaner contiguously disposed to filtering means and attached to the cleaning water conduit, jet means attached to the conduit filter cleaner, at least one ballast siphoning tube having a siphoning valve interconnecting the air chamber with a flow exit conduit that is secured to and around the water exit aperture, said air chamber includes at least one air chamber separation web connected on the inside thereof, at least one drain plug, and at least one air valve, said device having a flow exit conduit having an exit air valve, and positioned between and interconnecting said exit aperture and said hose exit means, the process comprises the steps of:

(a) pressuring the air chamber with a pneumatic matter to suspend the device in the river or pond;

(b) intaking water through the water intake chamber;

(c) filtering simultaneously to said intake step (b) said intaking water between said imperforate plate and said roof of said water intake chamber; and

(d) stabilizing said device by ballasting the air chamber through the ballast siphoning tube.

4. A device for removing water from a river, pond, or the like, that has a sandy base and/or moving or floating debris such as leaves, sticks, weeds comprising:

(a) a means for removing water from the river, pond, or the like, through the device;

(b) a water intake chamber having a roof with a base periphery defining a water intake opening, and a water exit aperture;

(c) a base plate;

(d) a hose exit means interconnecting the means for removing and the water exit aperture;

(e) a means for filtering the water being removed through the device, said means for filtering interconnecting the base plate and the base periphery of the roof;

(f) an air chamber circumscribing the roof of said water intake chamber; and

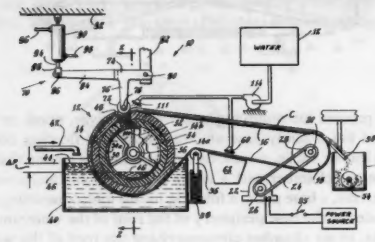
(g) a cleaning water conduit attached to said device, a pressurized water supply means connected to said water conduit, a conduit filter cleaner contiguously disposed to said means for filtering and attached to said cleaning water conduit, and a plurality of jet means attached to said conduit filter cleaner for flushing said means for filtering free of said debris; said water intake chamber defines a cone; said air chamber includes at least one air chamber separation web connected on the inside thereof, at least one drain plug, and at least one air valve, and said device comprises a flow exit conduit having an exit air valve, and positioned between and interconnecting said exit aperture and said hose exit means.

4,310,424

APPARATUS AND METHOD FOR REMOVING SUSPENDED SOLIDS FROM A STREAM

Henry A. Fremont, Wyoming; Mary C. Obenour, Fairfield, and Edward F. Hedrick, Loveland, all of Ohio, assignors to Champion International Corporation, Stamford, Conn.

Filed Jul. 23, 1980, Ser. No. 171,947
Int. Cl.[3] B01D *33/02*
U.S. Cl. 210—791 26 Claims



23. The method of removing fine solids from a stream comprising the procedural combination of steps of passing said stream through open-celled compressible hydrophobic polymeric foam material, compressing said hydrophobic foam to remove the solids loaded therein, expanding said compressed hydrophobic foam while maintaining it in a substantially water filled condition and repeating said steps.

4,310,425

INHIBITED OIL FIELD DRILLING FLUID

Morris D. Key, Dallas, and William H. Crawford, Jr., Fort Worth, both of Tex., assignors to Halabs, Incorporated, Fort Worth, Tex.

Filed Apr. 17, 1980, Ser. No. 140,994
Int. Cl.[3] C09K *7/02*
U.S. Cl. 252—8.5 A 9 Claims

1. In a drilling fluid for use in drilling a well wherein said fluid circulated through a drill string and bit penetrating subterranean formations and back to the surface for lubricating the bit, bringing rock cuttings and the like to the surface, said drilling fluid including water and a density increasing agent; the improvement comprising:

a. a carbohydrate additive selected from the class consisting of starch, carboxymethylcellulose, carboxyethylcellulose and carboxymethylhydroxyethylcellulose for controlling rheological properties, the carbohydrate additive being subject to the deleterious attack in the drilling fluid through the presence of undesirable elements including microorganisms and free radicals, and

b. a chlorine dioxide-producing system consisting essentially of a chlorine dioxide precursor $MClO_2$, where M comprises at least one of alkali metal cation and alkaline earth metal cation, and an acid salt, non-chlorine type initiator XH_nA, where X is alkali metal, ammonium, or alkaline earth metal cation, H is hydrogen, n is one or two, A is an acid anion selected from the class consisting of sulfate and phosphate for producing a micro zone of low pH within the drilling fluid for rapidly producing the chlorine dioxide to condition the drilling fluid and curtail the deleterious attack on the cellulosic additive.

4,310,426

DURABLE, ANTISTATIC, SOIL RELEASE AGENT

Kenneth C. Smeltz, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 932,398, Aug. 9, 1978, abandoned. This application Sep. 5, 1980, Ser. No. 184,478
Int. Cl.[3] C08G *12/30;* B05D *3/02;* D04H *1/58;* B32B *27/00*
U.S. Cl. 252—8.8 21 Claims

1. Antistatic soil release agent which (i) can be applied to a substrate by the exhaust technique, (ii) has durability to wear and laundering and resistance to yellowing on the substrate treated therewith, (iii) is capable of providing said durability by being cured at about 199° C. for 60–75 seconds and (iv) is of the formula

wherein

X is an aminoplast resin moiety having amino nitrogen atoms and 4 to 6 methylene groups, each of which methylene groups is attached to an amino nitrogen atom;

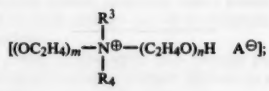
Y_1 is $O(C_2H_4O)_{5\text{-}20}R_1$;

R_1 is $C_{1\text{-}5}$ alkyl;

Y_2 is $O(C_2H_4O)_{5\text{-}88}R_2$;

R_2 is $C_{6\text{-}20}$ alkyl;

Y_3 is



R_3 is $C_{4\text{-}20}$ alkyl, $C_{4\text{-}20}$ alkenyl or benzyl;

R_4 is $C_{1\text{-}4}$ alkyl;

$A^{\ominus}$ is an organic or inorganic anion;

each of a and b can be 0 to 2, provided that the sum of a and b is 1 to 2;

c is 1 to 2;

the sum of a, b and c is 2 to 4;

each of m and n is at least 1 and the sum of m and n is 12 to 100;

said agent having a calculated hydrophile-lipophile balance (HLB) of 14.5 to 18.0, a 20 weight % aqueous solution viscosity, as measured at 20° C. on a Brookfield viscometer, of 0.250 to 16.000 pascal seconds, an electrical resistivity (Keithley log R) on polyester fabric, at 20±2% relative humidity and 23°±1° C., of no greater than 13.00 initially and no greater than 14.25 after ten washes, and a soil release rating on polyester fabric of at least 3 initially.

7. Agent of claim 1 dispersed or dissolved in a normally liquid medium.

4,310,427

WATER DISPERSIBLE BAND PLY LUBRICANT

Ten T. Wan, Palos Hills, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Apr. 25, 1980, Ser. No. 144,180
Int. Cl.[3] C10M *3/02, 3/04*
U.S. Cl. 252—21 6 Claims

1. A water reducible band ply lubricant composition consisting essentially of from 3 to 12% of a zinc soap of a long chain fatty acid, from 3 to 12% of a long chain fatty acid partial ester of sorbitan where at least two of the hydroxyl groups are not esterified; from 20 to 60% of a water soluble polymeric lubricant, the polymeric lubricant comprising the condensation product of alkylene glycols or alkylene oxides limited to alkylene groups containing more than one and less than four carbon atoms in the alkylene chain and a molecular weight in excess of

1,000; and from 30 to 74% of finely divided mica; all of the foregoing percents based upon the total non-volatile solids content, the foregoing non-volatile solids content thereof dispersed in an amount of water as the volatile content thereof sufficient to produce fluidity essential for application in a lubricating film.

6. The method of lubricating band ply and radial ply tires during manufacture which comprises lubricating said tires by application of the aqueous lubricating composition of claim 1.

4,310,428

LUBRICANTS, AND PROCESS FOR THICKENING ORGANIC LIQUIDS

Brunello Ciuti, San Donato Milanese, Italy, assignor to Snamprogetti, S.p.A., Milan, Italy

Continuation of Ser. No. 667,668, Mar. 17, 1976, abandoned. This application Mar. 28, 1979, Ser. No. 24,734

Claims priority, application Italy, Mar. 17, 1975, 21321 A/75; Dec. 11, 1975, 30191 A/75

Int. Cl.³ C10M *5/22, 5/02, 7/38, 7/02*

U.S. Cl. 252—33 **6 Claims**

1. A lubricating grease of which 60 to 95% by weight is a lubricating liquid and from 5 to 40% by weight is an overbasic alkylene sulfonate of a metal selected from the group consisting of alkaline earth metals, zinc and aluminum, said sulfonate being derived from alpha-olefins having between 12 and 24 carbon atoms and being rendered overbasic by the corresponding metal carbonate.

4,310,429

STABILIZED POLYMERS, NOVEL STABILIZERS, AND SYNTHESIS THEREOF

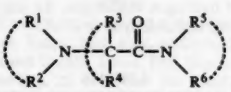
John T. Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 19, 1978, Ser. No. 916,639

Int. Cl.³ C10M *1/32, 1/24*

U.S. Cl. 252—51.5 A **35 Claims**

1. A stabilized composition of matter which comprises a synthetic lubricant subject to the deleterious effects of oxygen and heat and from about 0.001 percent to about 10 percent by weight of a substitued α-aminoacetamide of the formula



wherein R^1, R^2, R^3, R^4, R^5 and R^6 independently represent the following substituents: hydrogen; aryl, alkyl having from 1 to about 24 carbon atoms wherein functional groups may be substituted with alkyl groups; hydroxyalkyl having from 1 to about 12 carbon atoms; haloalkyl having from 1 to about 12 carbon atoms; cyanoalkyl having from 2 to about 12 carbon atoms; aminoalkyl or iminoalkyl having from 1 to about 12 carbon atoms; ether groups having from 3 to about 18 carbon atoms; alkenyl and aralkyl having from 7 to about 14 carbon atoms; alkylene having from 1 to about 7 carbon atoms; alkenylene having from 2 to about 10 carbon atoms; each substituent optionally containing a phosphite, ester or hindered phenol group, except that each amine and amide N atom has at least one substituent, and said each substituent in combination, R^1 with R^2, R^3 with R^4, and R^5 with R^6, optionally (i) forms a ring containing from about 5 to about 9 ring atoms, which ring optionally (ii) contains a hetero atom selected from the group consisting of N, S and O, and a moiety selected from the group consisting of keto, ester, amide, thio and ether.

4,310,430

α-OLEFIN-DIALKYLMALEATE-BASED LIQUID SEPARATING AGENT

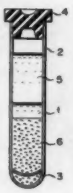
Toshizi Ichikawa; Teruko Watanabe, and Yoshimitsu Asada, all of Tokyo, Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed Sep. 4, 1980, Ser. No. 184,084

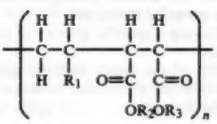
Claims priority, application Japan, Sep. 11, 1979, 54-116388; May 26, 1980, 55-69913

Int. Cl.³ B01D *17/00, 21/26;* **C09K** *3/00*

U.S. Cl. 252—60 **10 Claims**



1. A liquid separating agent for fractionating a liquid containing components of different specific gravities by separating a specific component by means of the specific gravity difference, characterized by consisting of, as the main component, a liquid α-olefin-dialkylmaleate copolymer having a specific gravity between 1.00 and 1.038 and the general formula



wherein

R_1 is an alkyl group having 5 to 58 carbon atoms which, in the copolymer molecule, may either be the same kind or a combination of different kinds; and R_2 and R_3 are selected from the group consisting of methyl, ethyl, butyl and 2-ethylhexyl groups; and n is an integer; and

at least one agent to control viscosity and specific gravity mixed therewith.

3. The liquid separating agent according to claim 1 wherein said agent to control viscosity and specific gravity are at least one element selected from the group consisting of aliphatic amine derivatives of smectite clay with carbon atom numbers between 8 and 24 and powdered silica.

4,310,431

FREE FLOWING BUILDER BEADS AND DETERGENTS

David P. Joshi, Piscataway, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 661,471, Feb., 1976, abandoned. This application Aug. 13, 1980, Ser. No. 177,784

Int. Cl.³ C11D *3/075, 3/08, 11/02, 17/06*

U.S. Cl. 252—91 **21 Claims**

1. A granular detergent having a flowability of at least about 70% that of clean, dry sand, which comprises:

(a) from about 60 to 88 percent by weight of spray dried base beads having detergent building properties comprising from about 45 to about 85% by weight of an alkali metal phosphate wherein from about 30 to about 60 percent of the phosphate is hydrated and the remainder is anhydrous, from about 5 to about 15 percent by weight of a sodium silicate having an $Na_2O:SiO_2$ ratio of from about 1:1.6 to about 1:3.4 and from about 5 to about 15% water, wherein a portion of the water is present as water of hydration in the hydrated phosphate, the beads being essentially free of

organic surfactant, organic detergent or soap, when spray dried; and

(b) from 12 to about 40 percent by weight of a nonionic polyethoxylated synthetic organic detergent;

(c) said beads having a structure of microcrystals and amorphous solid interconnected as an irregular network within the beads, the network defining interconnected irregularly shaped passageways, said passageways comprising a reticular void space within the beads and interconnecting to discrete openings on the external surface of the beads;

(d) the nonionic detergent being applied to the external surfaces of the spray dried beads and being substantially absorbed into the internal passageways of the beads to produce the granular detergent;

(e) the beads having a specific gravity of from about 0.5 to about 0.8; and

(f) at least 90% of the beads and the granular detergent having a particle size distributed between 20 mesh and 200 mesh U.S. sieve series.

4,310,432

LIQUID SOAP COMPOSITION

Hendrik W. Brouwer, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 839,534, Oct. 5, 1977, abandoned, which is a continuation of Ser. No. 714,450, Aug. 16, 1976, Pat. No. 4,065,398, which is a continuation of Ser. No. 641,203, Dec. 16, 1975, abandoned, which is a continuation of Ser. No. 450,533, Mar. 12, 1974, abandoned. This application Jun. 5, 1978, Ser. No. 912,700

Claims priority, application United Kingdom, Mar. 15, 1973, 12513/73; Sep. 24, 1973, 44624/73

The portion of the term of this patent subsequent to Dec. 27, 1994, has been disclaimed.

Int. Cl.³ C11D *9/00, 9/14, 9/30, 17/08*

U.S. Cl. 252—108 **2 Claims**

1. An aqueous liquid sodium soap solution containing from 20% to 45% by weight of a sodium soap consisting essentially of a mixture of

(A) at least one sodium soap of C_8–C_{14} saturated fatty acid and

(B) at least one sodium soap of fatty acids selected from the group consisting essentially of C_{16}–C_{22} mono and C_{16}–C_{22} di-unsaturated fatty acids and mixtures thereof, the ratio of A to B being from 4:1 to 1:4.

4,310,433

SUPERFATTED LIQUID SOAP SKIN CLEANSING COMPOSITIONS

Paul Stiros, Maineville, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 2, 1980, Ser. No. 183,125

Int. Cl.³ C11D *9/26, 9/48, 17/08*

U.S. Cl. 252—132 **4 Claims**

1. Clear aqueous liquid skin cleansing composition comprising: (1) from about 5% to about 25% of a mixture of potassium-neutralized and unneutralized fatty acids, the weight ratio of neutralized to unneutralized fatty acids being from about 24:1 to 7:1, the said fatty acids consisting essentially of C_{12} to C_{14} saturated fatty acids and C_{16} to C_{18} monounsaturated fatty acids, said fatty acids being present in a weight ratio of from about 1.2:1 to about 0.5:1 of saturated fatty acids to unsaturated fatty acids, and (2) from about 50% to about 94% water.

4,310,434

POLY(ETHYLENE OXIDE) COMPOSITIONS WITH CONTROLLED SOLUBILITY CHARACTERISTICS

Clement K. Choy, Danville, Calif., and Robert A. Greene, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 28, 1980, Ser. No. 153,993

Int. Cl.³ C11D *1/83, 3/37*

U.S. Cl. 252—174.21 **7 Claims**

1. A composition of matter in solid cake form, said composition comprising:

A. from about 8% to about 20% of a poly(ethylene oxide resin having a molecular weight from about 500,000 to about 7,000,000;

B. an alkali metal sulfate salt or mixture of said salts in a weight ratio of at least about 2.5:1 of alkali metal sulfate salt to resin; and

C. an organic surfactant in a weight ratio of surfactant to alkali metal sulfate salt of from about 0.5:1 to about 2:1.

4,310,435

METHOD AND COMPOSITION FOR REMOVING SULFIDE-CONTAINING SCALE FROM METAL SURFACES

Wayne W. Frenier, Tulsa, Okla., assignor to The Dow Chemical Co., Midland, Mich.

Filed Dec. 6, 1979, Ser. No. 100,794

The portion of the term of this patent subsequent to Sep. 2, 1997, has been disclaimed.

Int. Cl.³ C02F *5/10*

U.S. Cl. 252—180 **8 Claims**

1. In the method of chemically cleaning acid-soluble, sulfide-containing scale from a metal surface comprising contacting said scale with an aqueous acid cleaning composition comprising an aqueous non-oxidizing acid having at least one aldehyde dissolved or dispersed therein, which aldehyde is present in an amount at least sufficient to prevent or substantially prevent the evolution of hydrogen sulfide gas, the improvement comprising generating said aldehyde in situ.

4,310,436

POLYETHER-BASED THICKENERS WITH ADDITIVES FOR INCREASED EFFICIENCY IN AQUEOUS SYSTEMS

Ronald L. Camp, Riverview, Mich., assignor to BASF Wyandotte, Wyandotte, Mich.

Filed Oct. 22, 1979, Ser. No. 86,836

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—316 **20 Claims**

1. A polyether-based thickener for an aqueous system consisting essentially of in admixture:

A. a polyether having a molecular weight of about 1000 to about 25,000 which is selected from the group consisting of

(1) polyethers prepared by reacting a mixture of ethylene oxide and at least one lower alkylene oxide having 3 to 4 carbon atoms with at least one active hydrogen-containing aliphatic or alkyl aromatic compound containing no more than one active hydrogen and about 12 to about 18 aliphatic carbon atoms and at least one alpha-olefin oxide having a carbon chain length of about 12 to about 18 aliphatic carbon atoms and wherein said alpha-olefin oxide is present in the amount of about 1 to about

20 percent by weight based upon the total weight of said polyether, and

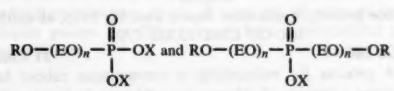
(2) polyethers prepared by reacting ethylene oxide and at least one lower alkylene oxide having 3 to 4 carbon atoms with at least one active hydrogen compound containing one active hydrogen and about 12 to about 18 aliphatic carbon atoms to prepare a heteric or block copolymer and further reacting said copolymer with at least one alpha-olefin oxide having a carbon chain length of about 12 to about 18 aliphatic carbon atoms and wherein said alpha-olefin oxide is present in the amount of about 1 to about 20 percent by weight based on the total weight of said thickener, and

(3) polyethers prepared by reacting (a) ethylene oxide and at least one alpha-olefin oxide with at least one active hydrogen compound to prepare a heteric copolymer or (b) ethylene oxide with at least one active hydrogen compound containing at least one active hydrogen to prepare a homopolymer and further reacting said homopolymer with at least one alpha-olefin oxide, said oxide having a carbon chain length of about 12 to about 18 aliphatic carbon atoms and wherein said active hydrogen compound is an aliphatic or alkylaromatic compound containing about 12 to about 18 aliphatic carbon atoms and said alpha-olefin oxide is present in the amount of about 1 to about 20 percent by weight based on the total weight of said thickener, and

about 10 to about 35 percent by weight based upon the total weight of said polyether polyol-based thickener of:

B. a mixture of a water-soluble amine and an ethoxylated phosphate ester, or an ethoxylated phosphate ester,

wherein said phosphate ester is selected from the group consisting of



and mixtures thereof, wherein EO is ethylene oxide; R is selected from the group consisting of linear or branched chain alkyl groups having about 6 to about 30 carbon atoms, and aryl or alkylaryl groups wherein said arylalkyl groups have about 6 to about 30 carbon atoms; X is selected from the group consisting of the residue of hydrogen, ammonia, an amine, an alkali or alkaline earth metal and mixtures thereof; and n is a number from 1 to 50.

4,310,437

FOAM BREAKER FOR GAS/LIQUID REACTORS

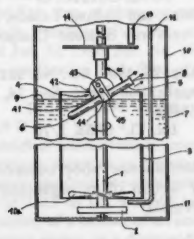
Anselm Schreiber, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Sep. 25, 1980, Ser. No. 190,829

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1979, 2938668

Int. Cl.³ B01D *19/02*

U.S. Cl. 252—361 **13 Claims**



1. A mechanical foam breaker for destroying a foam layer formed atop a liquid phase in gas/liquid reactors having a rotor, comprising at least one curved tube having an inlet and an outlet; and means for mounting said tube on the rotor at an oblique angle to the axis of rotation so that a portion of the liquid phase in the reactor is scooped up by said inlet and forced through the tube during rotation of the rotor, to emerge from the outlet as a liquid jet which penetrates the foam layer.

11. A mechanical foam breaker for destroying a foam layer formed atop a liquid phase in gas/liquid reactors having a rotor, comprising at least one elongated curved generally rod-shaped element; and means for mounting said element on the rotor at an oblique angle to the axis of rotation so that said element alternately at least partially immerses in and emerges from the liquid phase in the reactor, thereby splashing a portion of the liquid phase into the foam layer.

4,310,438

POLYETHYLENEAMINES AS SULFITE ANTIOXIDANTS

Joe C. Steelhammer, Lansdale, Pa.; Ian D. Morrison, Webster, N.Y., and Lawrence S. Wittenbrook, Doylestown, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 30, 1979, Ser. No. 25,304

Int. Cl.³ C09K *15/16*

U.S. Cl. 252—401 **12 Claims**

1. A method for reducing the amount of oxidation of sulfite to sulfate in a sulfite-containing aqueous gas scrubber medium, which method comprises adding to said medium an effective amount of a water soluble polyethyleneamine additive which contains at least one secondary amine moiety and two primary amine moieties, wherein the polyethyleneamine additive has the formula:

$$NH_2(CH_2CH_2NH)_XH$$

wherein X is 2 to about 10.

4,310,439

NOVEL TRIALKYL ALUMINUM COCATALYST

Arthur W. Langer, Watchung, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 18,340, Mar. 7, 1979, abandoned, which is a continuation-in-part of Ser. No. 896,561, Apr. 14, 1978, Pat. No. 4,158,642, which is a continuation-in-part of Ser. No. 812,530, Jul. 5, 1977, Pat. No. 4,145,313, which is a continuation-in-part of Ser. No. 790,832, Apr. 25, 1977, and Ser. No. 790,837, Apr. 25, 1977. This application Mar. 6, 1980, Ser. No. 127,805

Int. Cl.³ C08F *4/62, 4/64, 4/68*

U.S. Cl. 252—429 B **13 Claims**

1. An improved catalyst composition which comprises a mixture of:

(a) at least one alkyl metal compound having the formula R'''_3M, wherein M = Al, Ga or In, R''' is selected from the group consisting of C_1 to C_{20} primary, branched primary, secondary, or tertiary alkyl, cycloalkyl, alkenyl and aralkyl groups and hydride and mixtures thereof;

(b) a transition metal compound on a layer lattice support, a molar ratio of said R'''_3M to said transition metal compound being about 0.5:1 to 200:1; and

(c) at least one hindered Lewis base, said hindered Lewis base not causing excessive cleavage of metal-carbon bonds or loss of active sites under polymerization conditions said hindered Lewis bases being those whose complexing ability toward the R'''_3M is hindered sufficiently by steric and/or electronic effects to cause appreciable dissociation of the trialkyl metal-Lewis base complex under polymerization conditions; and

(d) at least one unhindered Lewis base, said unhindered base not causing excessive cleavage of metal-carbon bonds or loss of active sites under polymerization conditions.

4,310,440

CRYSTALLINE METALLOPHOSPHATE COMPOSITIONS

Stephen T. Wilson, Shrub Oak; Brent M. Lok, New York, and Edith M. Flanigen, White Plains, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jul. 7, 1980, Ser. No. 166,333

Int. Cl.[3] B01J *27/14, 31/02;* C01B *15/16*

U.S. Cl. 252—435 26 Claims

1. Crystalline aluminophosphates each having a framework structure whose chemical composition expressed in terms of mole ratios of oxides is:

Al_2O_3:1.0±0.2 P_2O_5:

each of said framework structures being microporous in which the pores are uniform and have nominal diameters within the range of about 3 to about 10 Angstroms, an intracrystalline adsorption capacity for water at 4.6 torr and 24° C. of at least 3.5 weight percent, the adsorption and desorption of water being completely reversible while retaining the same essential framework topology in both the hydrated and dehydrated state.

4,310,441

LARGE PORE SILICA-ALUMINA GELS AND METHOD OF PRODUCING THE SAME

Hamid Alafandi, Woodland Hills, and Dennis Stamires, Newport Beach, both of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 769,118, Feb. 16, 1977, Pat. No. 4,142,995, Ser. No. 874,755, Feb. 8, 1978, Ser. No. 935,628, Aug. 21, 1978, and Ser. No. 3,879, Jan. 16, 1979. This application Oct. 4, 1979, Ser. No. 81,655

Int. Cl.[3] B01J *21/12*

U.S. Cl. 252—453 35 Claims

1. A silica-alumina gel having a nominal SiO_2 to Al_2O_3 mole ratio in the range of about 1 to about 3 and having a pore structure such that the desorption pore volume in the range of pores 20 to 600 Angstroms diameter is about 0.6 or more cc/gr and the desorption pore volume in the range of pores of 20 to 50 Angstroms diameter is less than about 50% of the said desorption pore volume in the pores of 20 to 600 Angstroms and substantially less than the desorption pore volume in the pores in the range of 50 to 200 Angstroms diameter.

5. A process of producing a silica-alumina gel which comprises combining in a reaction mixture, sodium silicate, with an anionic aluminum and a cationic aluminum in amounts equivalent to a ratio of the moles of SiO_2 to the moles of Al_2O_3 in the cationic and anionic aluminum in the range of about 1 to about 3 moles of SiO_2 per mole of Al_2O_3 and the equivalent weight of Al_2O_3 in the anionic aluminum being less than 95% and more than 50% of the total equivalent weight of Al_2O_3 in the cationic and anionic aluminum source and adjusting the pH of the reaction mixture to a range of about 8 to about 9.

4,310,442

SUPPORTED SILVER CATALYSTS MIXED WITH PROMOTER METAL COMPOUNDS FOR THE PRODUCTION OF ETHYLENE OXIDE

Erwin Vangermain; Claus-Dieter Mengler; Rainer Elm; Horst Ueberschaer, and Wilhelm Brauckmann, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Jun. 24, 1980, Ser. No. 162,649

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1979, 2925625

Int. Cl.[3] B01J *21/12, 23/50*

U.S. Cl. 252—455 R 8 Claims

1. In a process for the preparation of a supported silver catalyst having a promoter metal compound for the production of ethylene oxide by the controlled, vapor phase, partial oxidation of ethylene with molecular oxygen in the presence of said supported silver catalyst having a promoter metal compound, the improvement comprising increasing the activity and extending the service life of said catalyst by preparing a physical mixture of particles consisting essentially of:

(a) supported silver catalysts and promoter metal compounds;

(b) supported silver catalysts and supported promoter metal compounds;

(c) promoter metal compound treated supported silver catalysts and promoter metal compounds; or

(d) promoter metal compound treated supported silver catalysts and supported promoter metal compounds; said supported silver catalysts, said promoter metal compounds and said supported promoter metal compounds having the same shape and particle size so that uniform mixing is obtained.

2. The process of claim 1, wherein said promoter metal compounds are selected from the group consisting of compounds of potassium, rubidium, cesium, barium or mixtures thereof.

4,310,443

PROCESS FOR VULCANIZING HALOGEN CONTAINING RUBBER COMPOSITION AT A LOW TEMPERATURE

Isamu Maeda, and Masashi Aoshima, both of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 33,696, Apr. 26, 1979, Pat. No. 4,248,987, which is a division of Ser. No. 814,918, Jul. 12, 1977, Pat. No. 4,166,892, which is a continuation of Ser. No. 655,547, Feb. 5, 1976, abandoned, which is a continuation of Ser. No. 429,588, Jan. 2, 1974, abandoned. This application Sep. 19, 1980, Ser. No. 188,613

Claims priority, application Japan, Jan. 12, 1973, 48-6805

Int. Cl.[3] C08L *15/02, 7/00*

U.S. Cl. 260—5 11 Claims

1. A process for vulcanizing a non-aqueous rubber base comprising a mixture of chloroprene rubber and a halogen-free amorphous polymer, said process comprising

vulcanizing said non-aqueous rubber base at a temperature ranging from 5° to 85° C. in the presence of

0.01 to 20 parts by weight of at least one vulcanizing agent selected from the group consisting of an organic hydroperoxide and ketone peroxide per 100 parts by weight of said rubber, and

0.01 to 20 parts by weight of at least one vulcanization activator or accelerator selected from the group consisting of (1) oxides of zinc, lead, chromium, cobalt, nickel, magnesium, manganese, copper, and iron, or salts of said metals with aliphatic or cycloaliphatic carboxylic acids having 8 to 24 carbon atoms, (2) methacrylates; (3) maleimides; and (4) oximes per 100 parts by weight of said rubber base.

4,310,444

FLAME RETARDANT SILICONE RUBBER COMPOSITIONS

Mitsuo Hamada, Chiba, and Sadami Yasuda, Ichihara, both of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Aug. 25, 1980, Ser. No. 181,301

Claims priority, application Japan, Sep. 14, 1979, 54-118405; Sep. 14, 1979, 54-118406

Int. Cl.[3] C08K *3/10*

U.S. Cl. 260—18 S 41 Claims

1. A flame retardant silicone rubber composition comprising (A) 100 parts by weight of an organopolysiloxane of the average unit formula

$$R_aSiO_{(4-a)/2}$$

wherein each R represents a substituted or unsubstituted

monovalent hydrocarbon radical and a has a value of from 1.95 to 2.05,

(B) 10 to 150 parts by weight of a finely pulverized silica filler,

(C) 2 to 200 ppm of platinum based on the weight of (A) or a platinum compound providing an equivalent amount of platinum,

(D) 0.05 to 3 parts by weight of a fatty acid compound where the fatty acid of the compound has at least 11 carbon atoms selected from the group consisting of a fatty acid, a metal salt of the fatty acid, or a mixture thereof, and

(E) 0.1 to 5 parts by weight of an organic peroxide.

4,310,445

PROCESS FOR FORMING A BARIUM SULFONATE CONTAINING POLYMER

Henry S. Makowski, deceased, late of Scotch Plains, N.J. (by Patricia H. Makowski, executrix), assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 18, 1980, Ser. No. 207,782

Int. Cl.³ C08L *91/00*

U.S. Cl. 260—23.5 A **12 Claims**

1. The process for preparing a cement of a barium neutralized sulfonated polymer having a Brookfield viscosity at 3.0 rpm at room temperature of less than about 50,000 cps which comprises the step of neutralizing a solution of a sulfonated polymer in a non-reactive solvent with excess barium type neutralizing agent dissolved in a solvent system consisting of a carboxylic acid having about 1 to about 4 carbon atoms or a mixture of methanol and said carboxylic acid having about 1 to about 4 carbon atoms to form said barium neutralized sulfonated polymer having about 10 to about 60 meq. of barium sulfonate groups per 100 grams of barium neutralized sulfonated polymer.

4,310,446

SEALANT COMPOSITION

Frank D. Gaus, and Edwin C. Klabunde, both of Sparks, Nev., assignors to Superior Products, Inc., Sparks, Nev.

Filed Jun. 23, 1980, Ser. No. 162,068

Int. Cl.³ C08L *91/00*

U.S. Cl. 260—28.5 AS **3 Claims**

1. A joint sealant composition comprising on a weight basis from about 57% to about 75% of an aromatic petroleum tar boiling between 220° C. and 650° C., from about 5% to about 18% of an oil-soluble ground rubber, from about 10% to about 17% of an inorganic filler, and from about 3% to about 6.5% of polyvinyl chloride, with the combined amount of rubber and polyvinyl chloride not exceeding 23% of the composition.

4,310,447

CURABLE AND CURED, MODIFIED AMINOTRIAZINE CONDENSATION PRODUCTS AND A MEANS AND PROCESS FOR THEIR MANUFACTURE

Wilhelm Weber, Frankfurt am Main, and Wilhelm Adam, Neu Isenburg, both of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 23, 1980, Ser. No. 171,302

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1979, 2930667

Int. Cl.³ C08L *61/28*

U.S. Cl. 260—29.4 R **12 Claims**

1. Curable, modified aminotriazine condensation product prepared by reacting in water or an organic solvent an aminotriazine condensation product pre-condensed to a dilutability ratio with water of 1:0.5 to 1:5, with 65 to 500% by weight, relative to the triazine, of a lactam of an aminocarboxylic acid having 3 to 18 carbon atoms, or a diaminedicarboxylate salt of a diamine having 2 to 18 carbon atoms and a dicarboxylic acid having 2 to 18 carbon atoms, or a mixture thereof, at a temperature of no more than 65° C.

4,310,448

PROCESS FOR THE PREPARATION OF STABLE IONIC DISPERSIONS

Artur Reischl, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1977, Ser. No. 804,842

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2627074

The portion of the term of this patent subsequent to Jan. 12, 1999, has been disclaimed.

Int. Cl.³ C08F *8/30*; C08K *5/05*; C08L *25/12, 75/04*

U.S. Cl. 260—29.6 NR **10 Claims**

1. In a process for the "in situ" preparation of stable dispersions of polyisocyanate polyaddition products in hydroxyl containing compounds as dispersing agents which comprises reacting

1. organic polyisocyanates with

2. compounds having primary and/or secondary amino groups and/or primary hydroxyl groups in

3. compounds having at least one hydroxyl group, compounds 3 having secondary hydroxyl groups if compounds 2 have primary hydroxyl groups and at least one of the components 1 or 2 having ionic groups and/or groups capable of salt formation, in the presence of from 2 to 50% by weight of water, based on the total quantity of reaction mixture the improvement which comprises carrying out the polyisocyanate polyaddition reaction in the presence of a polymer latex or the solution of an ionic polyurethane.

4,310,449

PROCESS FOR THE PREPARATION OF STABLE DISPERSIONS

Artur Reischl, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1977, Ser. No. 804,843

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2627073

The portion of the term of this patent subsequent to Jan. 12, 1999, has been disclaimed.

Int. Cl.³ C08F *8/30*; C08K *5/05*; C08L *25/12, 75/04*

U.S. Cl. 260—29.6 NR **10 Claims**

1. In a process for "in situ" preparation of stable dispersions of non-ionic polyisocyanate polyaddition products in compounds with hydroxyl groups as dispersing agents which comprises reacting

1. organic polyisocyanates with

2. compounds having primary and/or secondary amino groups and/or primary hydroxyl groups and/or ammonia in

3. compounds having at least one hydroxyl group, wherein compounds (3) having secondary hydroxyl groups if compounds 2 have primary hydroxyl groups and wherein the components are reacted together in the presence of more than 4% by weight of water, based on the quantity of reaction mixture including water, the water being subsequently removed in known manner if desired the improvement which comprises reacting said components in the presence of a polymer latex or solution of an ionic polyurethane.

4,310,450

CROSSLINKABLE AUTODEPOSITION COATING COMPOSITIONS CONTAINING A GLYCOLURIL DERIVATIVE

Alan E. Wang, South Charleston, and David R. Bassett, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

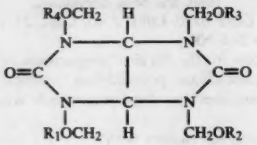
Filed Sep. 29, 1980, Ser. No. 191,999

Int. Cl.³ C08K *5/16*

U.S. Cl. 260—29.6 N **12 Claims**

1. In an aqueous autodeposition coating composition having a pH less than 5 comprising:

(I) water;
(II) a source of hydrogen ion;
(III) an oxidizing agent; and
(IV) a latex;
the improvement consisting of having from 0.1 to 30 weight percent, based on the dry weight of the resinous coating material in said latex, of a water insoluble derivative of glycoluril of the formula:



wherein R_1, R_2, R_3 and R_4 are each singly alkyl having at least 2 carbon atoms.

4,310,451
FREE FLOWING RIGID PVC RESIN POWDER COMPOSITIONS

Gerald W. Ernest, Willowick, and James R. DeFife, Mentor, both of Ohio, assignors to Diamond Shamrock Plastics Corporation, Dallas, Tex.

Filed Oct. 25, 1979, Ser. No. 88,120
Int. Cl.³ C08K 5/05
U.S. Cl. 260—34.2 **7 Claims**

1. In a method for preparing a filled, rigid poly(vinyl chloride) resin powder composition adapted for extrusion processing which consists essentially of blending together a particulate mass-polymerized poly(vinyl chloride) resin having an inherent viscosity of 0.7 to about 1.0 and a bulk density ranging from about 0.50 to 0.62 g/cc, from 85 to 95 percent of said resin particles being retained on 100 and 140 mesh sieves, and based on the weight of the resin, from 0.2 to 3.0 percent of a heat stabilizer therefor, from 0.1 to 5 percent of nonresinous lubricant, from 0 to 5 percent of resinous processing aid, from about 2 to 35 percent of filler and from 0.1 to 3 percent pigment until the temperature of the blending mixture attains a maximum temperature of 210°–280° F., the improvement which consists of incorporating into said blended composition from about 0.1 to 0.5 part glycerin per each 100 parts resin, by weight, whereby a filled, rigid mass-polymerized poly(vinyl chloride) resin powder composition exhibiting minimum buildup in the mixing equipment and commercially acceptable processing characteristics is produced.

4,310,452
FRICTION MATERIALS

John Chester, Stockport, England, assignor to Feroda Limited, Manchester, England

Division of Ser. No. 929,535, Jul. 31, 1978, Pat. No. 4,273,699. This application May 14, 1980, Ser. No. 149,697
Claims priority, application United Kingdom, Aug. 10, 1977, 33458/77
Int. Cl.³ C08L 9/02, 61/10
U.S. Cl. 260—38 **10 Claims**

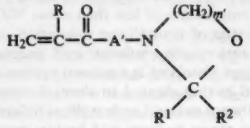
1. An asbestos-free friction material composition suitable for moulded friction pads consisting essentially of a thermosetting binder, a fiber-based reinforcement together with other fillers and additives, wherein
(a) the thermoset binder consists essentially of a phenolformaldehyde resin and optionally a nitrile rubber,
(b) the thermoset binder constitutes 20% to 60% by volume of the composition of which at least half is said phenolformaldehyde resin,
(c) the fiber-based reinforcement consists essentially of a mixture of (1) fine steel fibers having a length in the range of 1 to 5 mm, and (2) a non-asbestos mineral reinforcing filler powder containing mica, said steel fibers being the sole ferrous metallic component,
(d) the fiber-based reinforcement constitutes 10% to 35% by volume of the composition, and
(e) the balance of the composition consists essentially of inorganic friction and wear modifiers.

4,310,453
PIGMENT DISPERSIONS CONTAINING COPOLYMER OF OXAZOLIDINYLALKYL OR OXAZOLIDINYLALKOXYALKYL (METH)ACRYLATE

Raymond F. Jenkins, Mt. Laurel, N.J., and Graham Swift, Blue Bell, Pa., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Jan. 23, 1980, Ser. No. 114,544
Int. Cl.³ C08J 3/20; C08L 39/04
U.S. Cl. 260—42.54 **10 Claims**

1. A pigment dispersion consisting essentially of 20% to 60% by weight of pigment, 5% to 75% by weight of an organic solvent, and 5% to 35% by weight of a pigment dispersant, said pigment dispersant being a copolymer containing
(a) 0.5% to 40% by weight of units derived from a compound having the structural formula



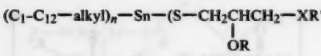
wherein
R is $+CH_2)_{n'-1}—H$;
R^1, when not directly joined to R^2, is selected from the group consisting of hydrogen, phenyl, benzyl, and alkyl groups having 1 to 12 carbon atoms;
R^2, when not directly joined to R^1, is selected from the group consisting of hydrogen and alkyl groups having 1 to 4 carbon atoms;
R^1 and R^2 when directly joined together with the attached carbon atom of the ring in the formula form a ring selected from the group consisting of pentamethylene and tetramethylene;
A′ is $—O(CH_2)_m—$ or $+O\text{-alkylene})_n—$ in which $+O—\text{alkylene})_{\overline{n}}$ is a poly(oxyalkylene) group having a molecular weight in the range of 88 to 348, n thus depending on said molecular weight, in which the individual alkylene radicals are the same or different and are either ethylene or propylene;
m and m′ are integers having a value of 2 or 3; and
n′ is an integer having a value of 1 or 2;
(b) 60% to 99.5% by weight of units derived from at least one comonomer selected from the group consisting of styrene, vinyltoluene, and esters of (meth)acrylic acid and alcohols having 1 to 18 carbon atoms; and
(c) 0 to 10% by weight of an α,β-ethylenically-unsaturated acid, said copolymer having an Mw of from about 6,000 to 50,000.

4,310,454
NOVEL ORGANO-TIN COMPOUNDS

Klaus-Peter Michaelis, Lindenfels, and Horst Müller, Fürth, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 27, 1980, Ser. No. 134,724
Claims priority, application Switzerland, Apr. 3, 1979, 3090/79
Int. Cl.³ C08K 5/57
U.S. Cl. 260—45.75 S **8 Claims**

1. An organo-tin compound of the formula I



wherein n is 1 or 2, R is hydrogen or a C_1–C_{18}acyl radical, X is oxygen or sulfur, and R′ is C_1–C_{20}alkyl.

7. A method of stabilising chlorinated polymers which comprises incorporating into said chlorinated polymer an effective stabilizing amount of a compound of the formula I according to any one of claims 1 to 6.

4,310,455
ANTIGEN FOR EARLY PREGNANCY TEST AND CONTRACEPTIVE VACCINE

Om P. Bahl, Williamsville, N.Y., assignor to Research Corporation, New York, N.Y.

Division of Ser. No. 30,772, Apr. 17, 1979, Pat. No. 4,234,561, which is a division of Ser. No. 875,497, Feb. 6, 1978. This application Aug. 28, 1980, Ser. No. 181,999

Int. Cl.³ A61K *39/385, 39/395, 39/44;* **C07G** *7/00*

U.S. Cl. 260—112 B **17 Claims**

1. An antigen which is capable of being administered to a host animal to induce an antibody response which is generally selective to human chorionic gonadotropin to a distinguishing degree from luteinizing hormone, which comprises a β-subunit of human chorionic gonadotropin which has been reduced such that five of the intrachain disulfide bonds are cleaved, and wherein said cleaved disulfide bonds have been alkylated, and wherein said subunit is futher conjugated with a protein or hapten which enhances the immunogenetic specificity of said antigen.

4,310,456
ANTIGENIC LINEAR PEPTIDE COMPOUND

Erwin Goldberg, Evanston, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Aug. 18, 1980, Ser. No. 179,049

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **1 Claim**

1. The antigenic linear peptide compound having the formula:

N-Arg-Met-Val-Ser-Gly-Gln-Thr-Arg-Leu-C

wherein N-Arg is an N-terminal L-arginine, Leu-C is a C-Terminal L-leucine, Gly is glycine, and Met, Val, Ser, Gln, Thr, and Arg, are the L-amino acid forms, respectively, of methionine, valine, serine, glutamine, threonine, and arginine.

4,310,457
HOT MELT ADHESIVE COMPOSITIONS

Pawan K. Agarwal, Westfield, N.J., and Henry S. Makowski, deceased, late of Scotch Plains, N.J. (by Patricia H. Makowski, executrix), assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 14, 1980, Ser. No. 196,210

Int. Cl.³ C08L *91/00*

U.S. Cl. 260—235 **10 Claims**

1. A hot melt adhesive composition which comprises:

(a) a highly unsaturated polybutadiene or polyisoprene hydrocarbon rubber;

(b) a neutralized sulfonated polystyrene resin said neutralized sulfonated polystyrene having about 80 to 250 meq. of neutralized sulfonated groups per 100 grams of said neutralized sulfonated polystyrene resin; and

(c) about 25 to about 200 parts by weight of a hydrocarbon tackifying resin based on a petroleum or coal tar distillate per 100 parts by weight of said neutralized sulfonated polysytrene resin.

4,310,458
PRODUCTION OF PENICILLINS

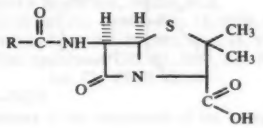
Derek Walker, Jamesville; Herbert H. Silvestri, Dewitt; Chester Sapino, East Syracuse, and David A. Johnson, Fayetteville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 21,852, Mar. 19, 1979, Pat. No. 4,240,960, which is a continuation-in-part of Ser. No. 4,780, Jan. 19, 1979, abandoned, which is a continuation-in-part of Ser. No. 970,704, Dec. 18, 1978, abandoned. This application Jul. 12, 1979, Ser. No. 56,976

Int. Cl.³ C07D *499/12*

U.S. Cl. 260—239.1 **11 Claims**

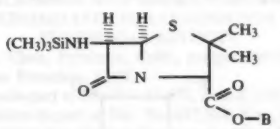
1. In the process for the production of a conventional penicillin having the formula



wherein

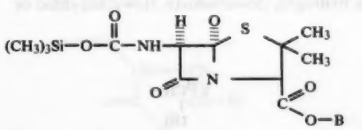
is the residue after removal of the hydroxyl group of an organic carboxylic acid containing from two to twenty carbon atoms

which comprises the consecutive steps of acylating with the acid chloride of said organic carboxylic acid a silylated nucleus having the formula



wherein B is an easily cleavable ester protecting group and then converting group B to hydrogen,

the improvement which comprises, prior to acylation, converting said silylated nucleus to a compound of the formula



wherein B has the same meaning as above, by adding dry carbon dioxide to a solution of said silylated nucleus in an anhydrous inert organic solvent at a temperature in the range of 0° C. to 100° C. until completion of the carbonylation reaction.

4,310,459

PROCESS FOR PRODUCING CARBAMOYL SUBSTITUTED PENAMS AND CARBAMOYL SUBSTITUTED CEPHAMS FROM PENICILLIN SULFOXIDE ESTERS

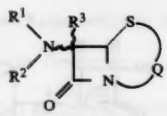
Robert L. Cundall, Liverpool, and Derek Walker, Jamesville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 893,092, Apr. 3, 1978. This application Nov. 7, 1979, Ser. No. 92,248

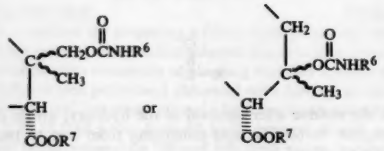
Int. Cl.³ C07D *499/04, 501/02*

U.S. Cl. 260—239.1 **106 Claims**

1. A process for the preparation of a compound of the formula



in which Q is

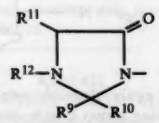


wherein

R^1 is hydrogen and

R^2 is an amino-blocking group or an acyl group, or

R^1 and R^2, taken together with the nitrogen to which they are attached, may form a phthalimido group, a succinimido group or a group of the formula



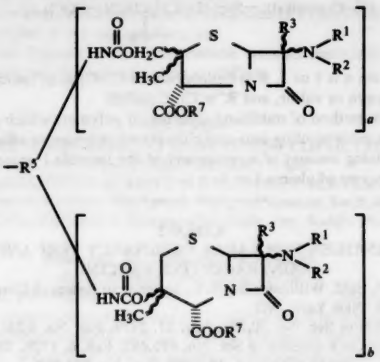
in which R^9 and R^{10} are (lower)alkyl, R^{11} is 1,4-cyclohexadienyl, substituted or unsubstituted phenyl, or a substituted or unsubstituted heterocyclic group containing one or more hetero atoms selected from sulfur, oxygen and nitrogen, and R^{12} is hydrogen, an aldehydo group or a nitroso group;

R^3 is hydrogen, (lower)alkoxy, (lower)alkylthio or

in which R^{13} is substituted or unsubstituted (lower)alkyl or aryl;

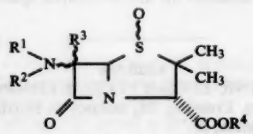
—$COOR^7$ is carboxyl, a protected carboxyl group or a derivative of a carboxyl group;

R^6 is hydrogen, is the same as R^5 or is



in which R^1, R^2, R^3 and R^7 are as defined above, R^5 is the residue of an acyl group, a thioacyl group, a substituted sulfonyl, sulfinyl or sulfenyl group, or a substituted metal or non-metal atom having a valence of from 2 to 5, and a and b are the same or different and represent an integer from 0 to n-1, wherein n is an integer of from 1 to 4, provided that the sum of a and b is not greater than n-1;

which process comprises reacting a compound of the formula



wherein R^1, R^2 and R^3 are as defined above, and $COOR^4$ is a protected carboxyl group or a derivative of a carboxyl group; at a temperature up to about 200°, in an inert organic solvent, with at least an equimolar amount of an isocyanate of the formula

$$R^5(NCO)_n;$$

and, if R^7 is not hydrogen, optionally converting $COOR^7$ to a carboxyl group by a conventional method; and, if R^6 is not hydrogen, optionally removing the R^6 group by conventional means.

4,310,460

PROCESS FOR THE PRODUCTION OF 6-D-α-AMINO-P-HYDROXYPHENYLACETAMIDO PENICILLANIC ACID

Marco Falciani, and Renato Broggi, both of Milan, Italy, assignors to Dobfar S.p.A., Milan, Italy

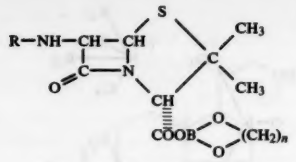
Filed Mar. 24, 1980, Ser. No. 133,442

Claims priority, application Italy, Nov. 2, 1979, 27013 A/79

Int. Cl.³ C07D *499/12*

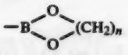
U.S. Cl. 260—239.1 **5 Claims**

1. A process for the production of the 6-D-α-amino-p-hydroxyphenylacetamido penicillanic acid, wherein, under anhydrous conditions and at a temperature between −20° C. and −60° C. there is reacted a compound of the formula:

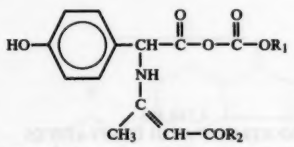


(I)

wherein R is —H or



and n is 2 or 3, with a compound of the formula:



(II)

wherein R_1 is an alkyl radical and R_2 is an alkoxy radical, in a solvent selected from the group consisting of dimethylformamide alone and of dimethylsulfoxide in admixture with methylene chloride or chloroform, and the resulting reaction mixture is treated as follows:

(a) the mixture is hydrolyzed with water obtaining two phases;
(b) the pH of the reaction mixture is lowered to about 0.8–1.8 by the addition of an aqueous solution of an acid, to remove the anaminic group;
(c) the aqueous phase is separated and treated by known means to convert the amoxicillin chlorohydrate contained therein to amoxicillin trihydrate, and
(d) the resulting product is isolated.

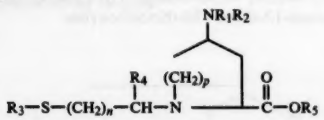
4,310,461

IMIDO, AMIDO AND AMINO DERIVATIVES OF MERCAPTOACYL PROLINES AND PIPECOLIC ACIDS

John Krapcho, Somerset, and Peter C. Wade, Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 23, 1980, Ser. No. 162,341
Int. Cl.³ C07D *207/16, 211/56*
U.S. Cl. 260—326.2 **13 Claims**

1. A compound having the formula



wherein

R_1 and R_2 are the same or different and are hydrogen, alkyl, cycloalkyl, 1-adamantyl, aryl, arylalkyl, alkylcarbonyl, arylcarbonyl, arylalkylcarbonyl, alkylsulfonyl, arylsulfonyl, or arylvinylcarbonyl;

R_3 is hydrogen, alkyl, aryl, arylalkyl, alkanoyl or arylcarbonyl;

R_4 is hydrogen, alkyl, alkylthio, or trifluoromethyl;

R_5 is hydrogen, alkyl, or arylalkyl;

n is 0, 1 or 2; and

p is 1 or 2; or a salt thereof, or symmetrical dimer thereof;

wherein the term "aryl" refers to phenyl, 1-naphthyl, 2-naphthyl or phenyl substituted with halogen, alkyl, alkoxy, alkylthio, hydroxy, alkanoyl, nitro, amino, dialkylamino, phenyl or trifluoromethyl groups; the term "cycloalkyl" refers to groups having 3 to 7 carbon atoms; the term "alkanoyl" refers to groups having up to 9 carbon atoms; and the terms "alkyl" and "alkoxy" refer to groups having 1 to 8 carbon atoms.

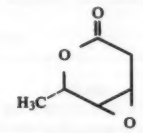
4,310,462

PROCESS FOR THE PREPARATION OF METHYL 3,4-ANHYDRO-2,6-DIDEOXY-L-RIBOHEXOPYRANOSIDE

Guenter Grethe, North Caldwell; Milan R. Uskokovic, Upper Montclair, and John Sereno, Pine Brook, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 48,108, Jun. 13, 1979, abandoned, which is a division of Ser. No. 850,982, Nov. 14, 1977, Pat. No. 4,174,344. This application Oct. 17, 1980, Ser. No. 197,845
Int. Cl.³ C07D *493/04*
U.S. Cl. 260—343.5 **1 Claim**

1. The L-isomer of the compound of the formula



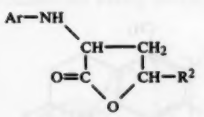
4,310,463

3-(N-ARYLAMINO)-GAMMA-BUTYROLACTONES, BUTYROLACTAMS AND THIOBUTYROLACTONES ARE INTERMEDIATES FOR COMPOUNDS HAVING FUNGICIDAL ACTIVITY

David C. K. Chan, Petaluma, Calif., assignor to Chevron Research, San Francisco, Calif.

Continuation-in-part of Ser. No. 13,856, Feb. 2, 1979, which is a continuation-in-part of Ser. No. 847,502, Nov. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 837,121, Sep. 29, 1977, Pat. No. 4,141,989, which is a continuation-in-part of Ser. No. 731,491, Oct. 12, 1976, Pat. No. 4,107,323, which is a continuation-in-part of Ser. No. 631,351, Nov. 12, 1975, Pat. No. 4,012,519, which is a continuation-in-part of Ser. No. 548,660, Feb. 10, 1975, Pat. No. 3,933,860. This application Aug. 17, 1979, Ser. No. 68,243
Int. Cl.³ C07D *307/32*
U.S. Cl. 260—343.6 **6 Claims**

1. A compound represented by the formula



(IV)

wherein Ar is is naphthyl, or phenyl or naphthyl substituted with 1 to 4 of the same or different substituents selected from fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or nitro; and R^2 is hydrogen or methyl.

4,310,464

LACTONES

Winston Costain; Bernard W. H. Terry, both of Manchester; Nazim Punja, Wokingham, and Peter J. V. Cleare, Ascot, all of England, assignors to Imperial Chemical Industries Limited, London, England

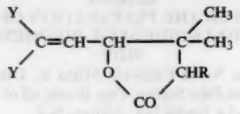
Filed Jul. 6, 1976, Ser. No. 702,732

Claims priority, application United Kingdom, Jul. 11, 1975, 29253/75

Int. Cl.³ C07D *307/32*

U.S. Cl. 260—343.6 **1 Claim**

1. A lactone of the formula:



wherein each Y is chlorine or bromine and R is hydrogen.

4,310,465

SYNTHESIS OF VITAMIN E AND QUINONE INTERMEDIATES

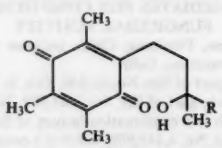
Gary L. Olson, Westfield, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 941,445, Sep. 11, 1978, abandoned, which is a division of Ser. No. 797,713, May 17, 1977, Pat. No. 4,127,608. This application Dec. 17, 1979, Ser. No. 104,488

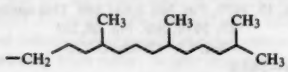
Int. Cl.³ C07C *46/06, 50/28*

U.S. Cl. 260—396 R **4 Claims**

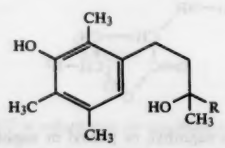
1. A process for producing a compound of the formula



wherein R is

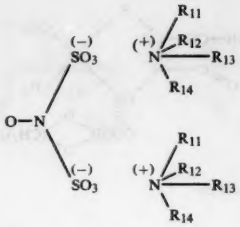


comprising oxidizing a compound of the formula



wherein R is as above

in the presence of a salt of the formula:



in an inert organic solvent medium

wherein R_{11}, R_{12} and R_{13} are alkyl containing from 1 to 20 carbon atoms and R_{14} is alkyl containing from 8 to 20 carbon atoms.

4,310,466

THIO ETIANIC ACID DERIVATIVES

John A. Edwards, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

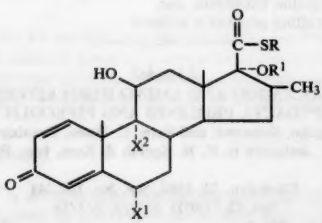
Continuation of Ser. No. 71,635, Aug. 31, 1979, Pat. No. 4,263,289, which is a continuation-in-part of Ser. No. 893,388, Apr. 5, 1978, Pat. No. 4,188,385. This application Nov. 7, 1980, Ser. No. 206,494

The portion of the term of this patent subsequent to Feb. 12, 1997, has been disclaimed.

Int. Cl.³ A61K *31/56*; C07J *9/00*

U.S. Cl. 260—397.1 **1 Claim**

1. The compound of the formula



wherein R is methyl, R^1 is acetyl, X^1 and X^2 are fluoro, namely methyl 17α-acetoxy-6α,9α-difluoro-11β-hydroxy-16β-methyl-3-oxoandrosta-1,4-diene 17β-thiocarboxylate.

4,310,467

PROCESS AND INTERMEDIATES FOR THE SYNTHESIS OF VITAMIN D_3 METABOLITES

Andrew D. Batcho, North Caldwell, N.J.; Donald E. Berger, Jr., Mountain View, Calif., and Milan R. Uskokovic, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

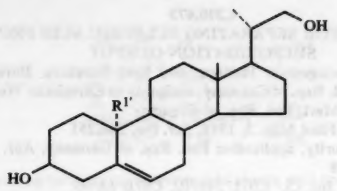
Filed Oct. 22, 1980, Ser. No. 199,167

Int. Cl.³ C07J *9/00*

U.S. Cl. 260—397.5 **42 Claims**

1. A process for the synthesis of compounds of the formula

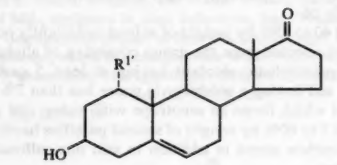
III-A



wherein $R^{1'}$ is hydrogen or hydroxy, which process comprises the steps of

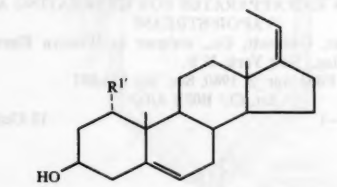
a. reacting a compound of the formula

IV



wherein $R^{1'}$ is hydrogen or hydroxy, with an ethyltriphenylphosphonium halide in the presence of strong base to yield a compound of the formula

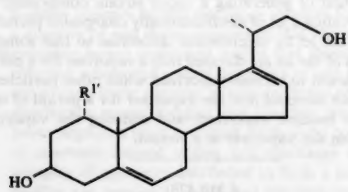
I-A



wherein $R^{1'}$ is hydrogen or hydroxy;

b. reacting the reaction product of step a. with formaldehyde or a compound capable of generating formaldehyde in situ in an inert solvent at temperatures ranging from −20° to 45° C. in the presence of Lewis or protic acids to yield a compound of the formula

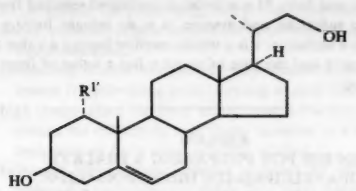
II-A



wherein $R^{1'}$ is hydrogen or hydroxy;

c. reacting the reaction product of step b. with hydrogen in an inert solvent in the presence of a hydrogenation catalyst at temperatures ranging from 0° to 48° C. to yield a compound of formula

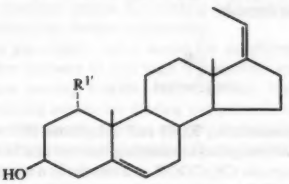
III-A



wherein $R^{1'}$ is hydrogen or hydroxy.

19. The compound (Z)-1α,3β-pregna-5,17(20)-diene-1,3-diol as characterized by the formula

I-A



wherein $R^{1'}$ is hydroxy.

4,310,468

EXTRACTION OF OIL FROM VEGETABLE MATERIALS

Robert A. Reiners, Hinsdale, Ill., assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Dec. 23, 1980, Ser. No. 219,779
Int. Cl.³ C09F *5/02*; C11B *1/10*
U.S. Cl. 260—412.4 **7 Claims**

1. A process for the extraction of oil from vegetable material consisting essentially of the steps of:

(a) dispersing a member selected from the group consisting of finely-divided, undried corn germ and finely-divided, undried coconut meats containing at least about 40% water by weight, in an oil solvent to give a solid-solvent dispersion;

(b) extracting oil from the solid-solvent dispersion with additional oil solvent;

(c) separating the oil solvent with oil from insoluble material; and

(d) recovering the oil from the oil solvent with oil.

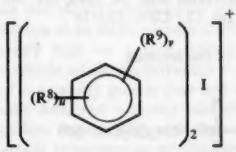
4,310,469

DIARYLIODONIUM SALTS

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 974,497, Dec. 29, 1978, abandoned, which is a continuation-in-part of Ser. No. 638,983, Dec. 9, 1975, which is a continuation of Ser. No. 466,375, May 2, 1974, abandoned. This application Feb. 1, 1980, Ser. No. 117,726
Int. Cl.³ C07F *9/90*
U.S. Cl. 260—446 **2 Claims**

1. A diaryliodonium salt having the formula,



where R^8 is a C_{19} organo radical selected from alkyl, haloalkyl

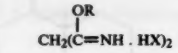
and branched alkyl, R^9 is selected from $G_{(1-3)}$ alkyl, $C_{(1-8)}$ alkoxy, nitro and halo, M is a metal or metalloid selected from phosphorus, antimony and arsenic, u is an integer having a value of 1 to 4 inclusive, v is a whole number having a value of 0 to 3 inclusive and the sum of u and v has a value of from 1 to 4 inclusive.

4,310,470
PROCESS FOR PREPARING A DIALKYL PROPANEDIIMIDATE DIHYDROHALIDE

Charles D. Adams, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 24, 1980, Ser. No. 143,375
Int. Cl.³ C07C *119/18*
U.S. Cl. 260—453.7 **7 Claims**

1. A process for preparing a dialkyl propanediimidate dihydrohalide of the formula



$$CH_2(C(OR)=NH \cdot HX)_2$$

by reacting malononitrile, ROH and anhydrous HX wherein the improvement comprises conducting the reaction in an alkyl acetate of the formula CH_3COOR as a solvent at a temperature of from about −5° C. to about 45° C., said ROH being present in an amount from stoichiometric to about 30% molar excess and

R being methyl or ethyl and

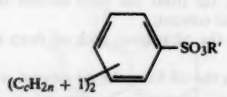
X being chloride or bromide.

4,310,471
ALKYL ARYL SULFONATE ESTERS

Alexis A. Oswald, Mountainside, and Edmund J. Mozeleski, North Plainfield, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 935,610, Aug. 21, 1978, abandoned. This application Feb. 28, 1980, Ser. No. 125,501
Int. Cl.³ C07C *141/00*; B01F *17/02*
U.S. Cl. 260—456 P **3 Claims**

1. Dialkyl benzene sulfonate esters of the formula



$$(C_cH_{2c+1})_2 \quad SO_3R'$$

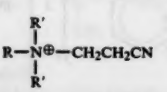
wherein R′ is C_1 to C_2 alkyl; c is 9 to 50.

4,310,472
QUATERNARY AMMONIUM ADDUCTS OF POLYMERIZABLE TERTIARY AMMONIUM SALTS AND ACRYLONITRILE

Rudolf S. Buriks; Allen R. Fauke, and David W. Griffiths, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 955,443, Oct. 27, 1978, Pat. No. 4,230,839, which is a division of Ser. No. 523,813, Nov. 14, 1974, Pat. No. 4,179,549. This application Mar. 24, 1980, Ser. No. 133,047
Int. Cl.³ C07C *121/16*
U.S. Cl. 260—465.4 **5 Claims**

1. A composition of the formula



$$R-N^{\oplus}(R')(R')-CH_2CH_2CN \quad X^{\ominus}$$

where R is a methacrylamidoalkyl group or acrylamidoalkyl group, each R′ is an alkyl group and $X^{\ominus}$ is an anion.

4,310,473
PROCESS FOR SEPARATING SULFURIC ACID FROM SULFOXIDATION OUTPUT

Hermann Springmann, Haltern, and Karl Borchers, Borken, both of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Mar. 3, 1981, Ser. No. 240,251
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1980, 3013808
Int. Cl.³ C07C *143/02*; C07B *13/00*
U.S. Cl. 260—504 S **4 Claims**

1. A process for separating sulfuric acid from a sulfoxidation product containing in addition to said sulfuric acid, paraffin sulfonic acids, water and non-sulfonated paraffins, which comprises:

(A) admixing with the sulfoxidation product in a ratio of about 0.25 to 2.5 parts by weight of a mixture consisting essentially of:

(a) about 40 to 95% by weight of at least one slightly polar alcohol selected from the group consisting of aliphatic and cycloaliphatic alcohols having at least 5 carbon atoms and having a solubility in water less than 7% by weight which forms an azeotrope with water; and

(b) about 5 to 60% by weight of second paraffins having 7 to 30 carbon atoms in addition to said non-sulfonated paraffins

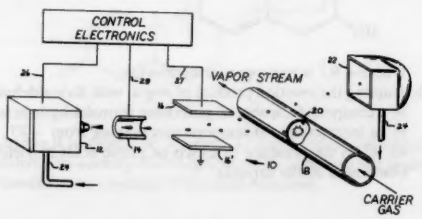
and thereby forming an aqueous phase containing said sulfuric acid and an organic phase containing said paraffin sulfonic acids and said paraffins; and

(B) separating said aqueous phase from said organic phase.

4,310,474
METHOD AND APPARATUS FOR GENERATING A VAPOR STREAM

Rama Iyengar, Gwinnett, Ga., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 2, 1980, Ser. No. 136,597
Int. Cl.³ B05B *5/02*
U.S. Cl. 261—1 **13 Claims**



1. A method of generating a vapor stream comprising the steps of providing a jet of electrostatically chargeable particles; controlling the jet by electrostatic deflection so that some of the particles of the jet are directed into a vaporizer for a period of time sufficient to become vaporized while other particles of the jet are not directed into the vaporizer for a period of time sufficient to become vaporized; and emitting the vaporized particles from the vaporizer as a stream.

4,310,475
TOWER PACKING ASSEMBLY

Max Leva, 5600 Munhall Rd., Pittsburgh, Pa. 15217

Filed Jun. 2, 1980, Ser. No. 155,617
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—113 **5 Claims**

1. A liquid-gas contacting apparatus for distillation, gas

absorption and related mass transfer operations, comprising a series of vertically spaced, horizontally extending sheets, each being provided with a plurality of openings which are laterally offset from openings of adjacent sheets, and a porous material

extending in the space between said sheets, said openings being surrounded by downwardly extending chimneys and said porous material having only line contact on its top surface with said chimneys.

4,310,476

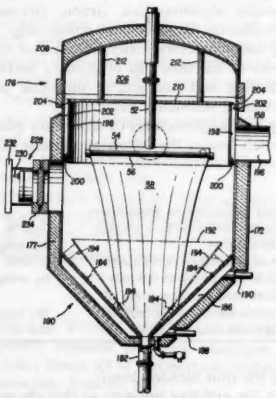
APPARATUS FOR TREATING FLUENT MATERIALS

John E. Nahra, Potomac, and Walter Woods, Silver Spring, both of Md., assignors to Dasi Industries, Inc., Washington, D.C.

Continuation-in-part of Ser. No. 29,391, Apr. 12, 1929, abandoned, which is a continuation of Ser. No. 806,849, Jun. 15, 1977, abandoned. This application Oct. 10, 1979, Ser. No. 83,362

Int. Cl.[3] B01F *3/04*

U.S. Cl. 261—118 23 Claims



1. A dispensing head for forming a fluid product into a thin, continuous isolated film comprising:

an elongated tubular head means for forming a chamber for receiving a quantity of said fluent material, said head means having an elongated discharge aperture extending parallel to a longitudinal axis thereof;

supply means coupled to said elongated head means at a position opposite to said discharge aperture for supplying a quantity of said fluent material to said chamber,

distributing means positioned within said chamber for distributing substantially equal quantities of said fluent material to each linear segment of said discharge aperture, said distribution means dividing said chamber into upper and lower segments interconnected exclusively by a plurality of apertures formed within said discharge means, said plurality of apertures distributed to form a progressively smaller net opening through said distribution means in a direction along said longitudinal axis of said head extending outwardly from said coupling position of said supply means,

a sheet of flexible, chemically inert plastic material wrapped around said distribution means and having the free ends thereof extend through said discharge aperture to form a distribution guide for said fluent material.

21. A system for processing fluent materials comprising:

fluent material supply means for delivering a flow of said fluent material,

preheating means coupled to said fluent material supply means for providing initial heating to said fluent material,

high temperature sterilizer means coupled to said preheating means for subjecting said fluent material to a sterilization temperature for a short interval of time,

balanced force control means coupled to said sterilizer means for maintaining a stable fluid level therein independent of changes in system dynamics,

cascaded pressure, temperature control means coupled to said high temperature sterilizer means for controlling the pressure and temperature therein;

flash cooling chamber means coupled to said high temperatue sterilizer means for cooling said fluent material after sterilization; further comprising:

heated gas supply valve means for supplying a heated gas under pressure to said high temperature sterilizer means,

pressure sensing means coupled to said high temperature sterilizing means for sensing gas pressure therein,

temperature sensing means coupled to said high temperature sterilizing means for sensing fluent material temperature therein; and wherein

said cascaded pressure, temperature control means is coupled to said valve means for controlling the supply of said heated gas delivered to said high temperature sterilizing means, in response to temperature and pressure measurements.

4,310,477

METHOD OF MAKING A SILICON NITRIDE PART

James C. Uy, Farmington Hills, and Andre Ezis, Grosse Ile, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 25, 1977, Ser. No. 781,374

Int. Cl.[3] C04B *35/58*

U.S. Cl. 264—62 10 Claims

1. A method of making a silicon nitride part which comprises the steps of:

making an article of silicon nitride, said article having a density less than the theoretical density of silicon nitride, said silicon nitride article also containing a densification aid therein;

coating the entire surface area of said silicon nitride article with a silicon nitride skin which is impervious to the passage of a gas therethrough;

heating said silicon nitride article with said silicon nitride skin thereon to a temperature for a time sufficient to result in the diffusion of sufficient of said densification aid contained in said silicon nitride article into said silicon nitride skin so that said silicon nitride skin may be subjected to high pressures without cracking;

subjecting said silicon nitride article and said silicon nitride skin thereon to an inert, gaseous atmosphere at a pressure sufficiently high for a time sufficiently long that said silicon nitride article is compacted to increase the density thereof to a density greater than said silicon nitride article originally had, and whereby said silicon nitride skin is pressed into engagement with the compacted silicon nitride article to become an integral portion of the finished part.

4,310,478
REINFORCING FIBERS AND METHOD OF PRODUCING SAME CORONA TREATMENT OF THERMOPLASTIC FIBERS

Jorgen Balslev, Copenhagen-Holte, and Laust O. Madsen, Esbjerg-Saedding, both of Denmark, assignors to Jacob Holm Varde A/S, Varde, Denmark

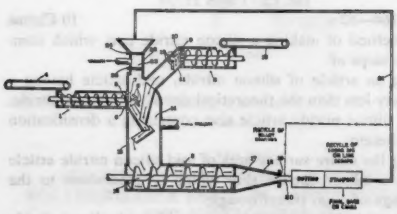
Filed Jul. 6, 1979, Ser. No. 55,287
Claims priority, application Denmark, Jul. 7, 1978, 3081/78
Int. Cl.³ B29C *17/14;* B29D *7/20*
U.S. Cl. 264—22 8 Claims

8. A method for producing reinforcing fibers of polypropylene, comprising stretching a polypropylene film in a ratio of at least 1:15, fibrillating the stretched film by means of a needle or cutter roller, and heat stabilizing the resulting fibers, corona treating the heat stabilized fibers and applying a wetting agent on the corona treated fibers to impart to the fibers a surface tension in the range of from 40 dyn/cm to about the surface tension of water.

4,310,479
PROCESS FOR MAKING TRANSPARENT VARIEGATED SOAP BARS

Julius Ooms, Langdorp, Belgium; Bernard Retureau, Cincinnati, Ohio, and Andre Imbaud, Venelles, France, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 15, 1980, Ser. No. 187,372
Claims priority, application United Kingdom, Sep. 14, 1979, 32032/79
Int. Cl.³ B29F *3/12*
U.S. Cl. 264—37 8 Claims

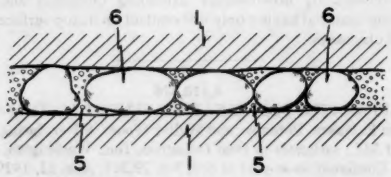


1. A continuous process for the manufacture of transparent variegated soap bars wherein scrap soap is recycled without loss of transparency, said process comprising the steps of
(a) separately forming opaque soap noodles and transparent soap noodles;
(b) introducing separate streams of the opaque noodles and the transparent noodles into a vacuum chamber and commingling them therein;
(c) separately introducing scrap soap into the vacuum chamber;
(d) feeding the noodles and scrap soap from the vacuum chamber into a plodder and extruding the noodles and scrap soap therein to form a soap log;
(e) forming the soap log into soap bars.

4,310,480
PROCESS FOR FABRICATION OF DENSE-STRUCTURE REFRACTORIES WHICH HAVE RESISTANCE TO SPALLING

Shyoichiro Fujimoto, Kitakyushu, and Haruyuki Ueno, Munakata, both of Japan, assignors to Kurosaki Refractories Co., Ltd., Fukuoka, Japan

Continuation of Ser. No. 763,177, Jan. 27, 1977, abandoned, which is a continuation-in-part of Ser. No. 599,208, Jul. 25, 1975, abandoned. This application Dec. 15, 1978, Ser. No. 969,766
Claims priority, application Japan, Aug. 13, 1974, 49-92905
Int. Cl.³ C04B *33/22*
U.S. Cl. 264—56 1 Claim



1. In a process for fabricating dense refractories from at least one refractory material selected from the group consisting of magnesite, magnesite-chromic oxide, chromic oxidemagnesite, magnesite-alumina, alumina-silica, zircon, zirconia, alumina and chromic oxide, the improvement comprising:
(a) grinding said refractory materials into fine and/or ultra-fine powder of less than 74μ of primary particulate,
(b) reconstituting said fine and/or ultra-fine powder into agglomerates of secondary particulate,
(c) blending said agglomerates of secondary particulates to make a batch having the following particle size composition:

a fine powder of secondary particulates and primary particulate with a particle size less than 0.1 mm	0–10% by weight
a fine grain of secondary particulates with a particle size of 0.1 to 0.5 mm	0–30% by weight
an intermediate and a coarse grain of secondary particulates with a particle size that is greater than 0.5 mm	the balance of the mixture

(d) molding the thus blended batch,
(e) adjusting the molding pressure so that the ratio of p/p_o lies in the range of 0.95 to 1.00, wherein p represents the bulk specific gravity of the resultant molded green body and p_o represents the average bulk specific gravity of said secondary particulate used for preparing said green body, and
(f) firing at a temperature of 1600° to 1800° C. the molded green body, thereby to produce a dense structure refractory having an apparent porosity of less than 10% by volume and having high resistance to spalling.

4,310,481
HIGH YIELD SILICON CARBIDE PRE-CERAMIC POLYMERS

Ronald H. Baney, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 23, 1980, Ser. No. 171,551
Int. Cl.³ F27B *9/04*
U.S. Cl. 264—65 11 Claims

8. A method of preparing a filled ceramic article which consists of
(A) mixing a polysilane with at least one conventional ceramic filler which polysilane has the average formula

$\{(CH_3)_3Si\}\{CH_3Si\}$

in which polysilane there is from 0 to 60 mole percent $(CH_3)_2Si=$ units and 40 to 100 mole percent $CH_3Si=$ units, wherein there is also bonded to the silicon atoms other silicon atoms and the $(CH_3)_3SiO-$ radical wherein there is present in the polysilane 23 to 61 weight percent of $(CH_3)_3SiO-$ based on the weight of the polysilane,

(B) forming an article of the desired shape from the mixture of polysilane and fillers and,

(C) heating the article formed in (B) in an inert atmosphere or in a vacuum to an elevated temperature in the range of 1150° C. to 1600° C. until the polysilane is converted to a silicon carbide-containing ceramic.

4,310,482

HIGH YIELD SILICON CARBIDE PRE-POLYMERS

Ronald H. Baney, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 23, 1980, Ser. No. 171,552

Int. Cl.³ F27B *9/04*

U.S. Cl. 264—65 **10 Claims**

7. A method of preparing a filled silicon carbide-containing ceramic article which consists of

(A) mixing a polysilane with at least one conventional ceramic filler which polysilane has the average formula

$\{(CH_3)_2Si\}\{CH_3Si\}$

in which polysilane there is from 0 to 60 mole percent $(CH_3)_2Si=$ units and 40 to 100 mole percent $CH_3Si=$ units, wherein the remaining bonds on silicon are attached to either another silicon atom or a hydrogen atom such that the polysilane contains from 0.3 to 2.1 weight percent of hydrogen attached to silicon, based on the weight of the polysilane;

(B) forming an article of the desired shape from the mixture of polysilane and fillers and,

(C) heating the article formed in (B) in an inert atmosphere or in a vacuum to an elevated temperature in the range of 700° C. to 1600° C. until the polysilane is converted to a silicon carbide-containing ceramic article.

4,310,483

THERMAL TUMBLING GRANULATION

Werner H. Dörfel, Reinach; Bernhard Medinger, Aesch, and Eduard Troxler, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 3, 1979, Ser. No. 63,233

Claims priority, application Switzerland, Aug. 15, 1978, 8677/78

Int. Cl.³ C08J *3/00*

U.S. Cl. 264—117 **9 Claims**

1. A process for producing a granulate of a difficultly fusible pigment additive for plastics by thermal tumbling granulation, which process comprises

mixing the pigment, selected from the group consisting of azo, azomethine, anthraquinone, phthalocyanine, nitro, perinone, perylene, quinophthalone, dioxazine, thioindigo, iminoisoindolinone and quinacridone pigments, metal complexes of azo, azomethine methine dyes having pigment character, carbon black, titanium dioxide, iron oxide, lead chromates, and mixtures thereof, in powder form with a granulating auxiliary which softens between 30° and 200° C. and which has a particle size of 0.1–2.0 mm, selected from the group consisting of synthetic resins, semi-synthetic resins, natural resins, plasticizers, metal soaps and waxes, and

subjecting this mixture to a gentle rotary motion with a peripheral speed of 0.3–2.2 m/sec, with heating by means of source of heat being simultaneously applied at least until softening of the granulating auxiliary commences.

4,310,484

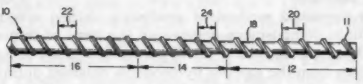
METHOD FOR EXTRUDING MOLTEN NARROW MOLECULAR WEIGHT DISTRIBUTION, LINEAR, ETHYLENE COPOLYMERS

Theodore R. Blakeslee, III, Hillsborough, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 1, 1980, Ser. No. 174,542

Int. Cl.³ B29F *3/06*

U.S. Cl. 264—176 R **10 Claims**



1. A method for extruding granular low density narrow molecular weight distribution linear ethylene polymers which comprises passing said granular polymers into an extrusion apparatus including an extruder screw, said extruder screw having a feed section wherein said polymers are introduced and thence passed through a transition section and a metering section, wherein each lead in the feed section is substantially the same and each lead in the metering section is substantially the same and wherein each lead in the feed section is 5 to 50 percent greater than each lead in the metering section.

4,310,485

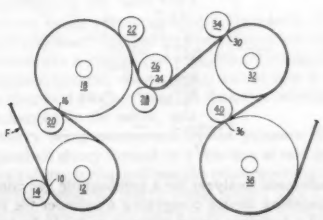
METHOD OF IMPROVING THE FLATNESS OF COMPRESSION-ROLLED PLASTIC FILM

Rikhard C. Dauber, Danville, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Sep. 26, 1980, Ser. No. 191,472

Int. Cl.³ B29C *17/02, 25/00*

U.S. Cl. 264—288.4 **10 Claims**



1. A method of improving the flatness of compression-rolled plastic film comprising

(a) passing the compression-rolled film under tension over the surface of a roll while heating the film on the roll to an elevated temperature below the melting point of the plastic film,

(b) passing the heated film through the nip between a driven roll and a nip roll such that the film is stretched at least three percent in the machine direction,

(c) while maintaining the film under tension, passing the stretched film over a tempering roll to set the film on the roll, and

(d) while still maintaining the film under tension, passing the set film over a cooling roll to cool the film to a temperature which approaches ambient temperature.

4,310,486
COMPOSITIONS OF CEMENTITIOUS MORTAR, GROUT AND CONCRETE

Charles E. Cornwell, 7104 Marlan Dr., Alexandria, Va. 22307, and Mark Plunguian, 1515 S. Jeff. Davis Hwy., Arlington, Va. 22202

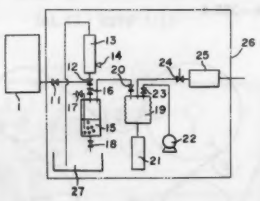
Continuation-in-part of Ser. No. 718,522, Aug. 30, 1976, Pat. No. 4,088,808. This application Aug. 5, 1980, Ser. No. 175,667
Int. Cl.³ B28B *21/44*
U.S. Cl. 264—309 3 Claims

1. An improved method of producing shaped articles of cementitious compositions comprising the steps of dispersing in 50–80 parts water about 15–40 parts silica fume, being the particulates from the gaseous by-products obtained during the manufacture of metallic silicon and ferrosilicon alloys, 50–80 parts fly ash, 10–150 parts aggregate, and 0.25–1.5 parts water reducer selected from the groups of polymers consisting of the alkali metal salt of melamine sulfonic acid partially condensed with formaldehyde, the alkali metal salt of naphthalene sulfonic acid partially condensed with formaldehyde, and about 30–90 percent of the alkali metal salt of a high molecular weight condensation product of naphthalene sulfonic acid and the balance 70–10 percent being the alkali metal salt of gluconic acid, all in parts by weight, spraying or casting the composition thus formed in a mold or on a substrate, and allowing the composition to cure.

4,310,487
AUTOMATIC ANALYZER FOR COMBUSTIBLE GAS IN OIL

Mitsuhiro Yamada; Hirokazu Katayama, both c/o Kansai Electric Power Company Incorporated, Sohgo Gityutsu Kenkyusho, No. 1, Nakohji Ichinotsubo, Amagasaki-shi, Hygo-ken, Japan; Toshitsugu Ishii; Yoshihiro Makino, both of Akoh, Japan, and Masashi Kamio, Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo; Mitsuhiro Yamada and Hirokazu Katayama, both of Hyogo, all of, Japan

Filed Mar. 26, 1980, Ser. No. 134,073
Claims priority, application Japan, Mar. 26, 1979, 54/35322
Int. Cl.³ G01N *33/28*
U.S. Cl. 422—68 5 Claims



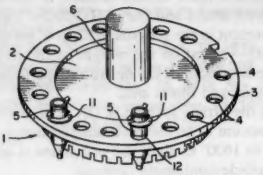
1. An automatic analyzer for a combustible gas comprising:
a gas desorbing device comprising a cylinder for receiving oil and a bubbling vessel wherein an oil to be sampled is fed from said cylinder into said vessel and a gas dissolved in said oil;
a gas discharger connected to said bubbling vessel to discharge said desorbed gas out of said vessel; and
a combustible gas detector which detects a concentration of said combustible gas in said desorbed gas.

4,310,488
SAMPLE OR REAGENT CONTAINER FOR ANALYZERS

Jürg Rahm, Basel, and Lothar Waltz, Ettingen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 19, 1980, Ser. No. 151,240
Int. Cl.³ B01L *3/00*; B65D *23/12*
U.S. Cl. 422—102 4 Claims

1. A tubular sample or reagent container for analytical devices, in particular centrifugal analyzers, the body of the container being insertable in apertures in a plate forming part of the analyzer and serving as carrier of the container, which has at its upper part a peripheral edge for bearing on said plate the

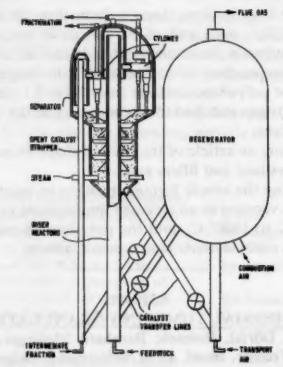


improvement comprising an abutment disposed below the peripheral edge of the container and deformable in the centripetal direction.

4,310,489
APPARATUS FOR THE CATALYTIC CRACKING OF HYDROCARBONS

Robert J. Fahrig, Lansing, and Lansing M. Hinrichs, Chicago, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 14, 1980, Ser. No. 178,140
Int. Cl.³ G05D *7/00, 16/00*; B01J *8/26, 8/18*
U.S. Cl. 422—110 4 Claims



1. A fluid catalytic cracking and fractionation apparatus for simultaneously effecting primary cracking of a hydrocarbon feedstock, separating the cracked products into a desired product fraction, and a second fraction suitable for additional secondary cracking, and for recracking said second fraction, said apparatus comprising:
(a) a primary cracking reactor having inlet means at its lower end for introduction of hydrocarbon feedstock and regenerated fluid catalytic cracking catalyst, the upper end of said primary cracking reactor opening into a separator vessel;
(b) a primary fractionation tower interconnected with the vapor space at the top of the separator vessel for receiving and separating the vaporized cracked products from said primary cracking reactor;
(c) a secondary riser reactor having inlet means at its lower end for receiving an intermediate fraction from said primary fractionation tower together with regenerated fluid catalytic cracking catalyst, the downstream end of said secondary riser reactor being within said separator vessel;
(d) a flow reversal means at the downstream end of said secondary riser reactor and an attached downwardly directed flow reversal conduit for directing the flow of recracked hydrocarbon product and entrained cracking

catalyst downwardly toward the bottom of said separator vessel;

(e) cyclone separator means having an opening laterally communicating with the interior of said flow reversal conduit and connected to vent the recracked hydrocarbon products outside of the separator vessel; and

(f) pressure control means for maintaining the pressure within said flow reversal conduit at least equal to or slightly higher than the pressure within said separator vessel whereby flow of vapor from said separator vessel into said cyclone separator means is prevented.

4,310,490

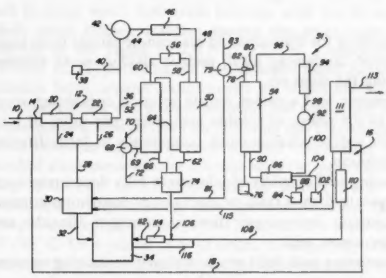
APPARATUS FOR ENRICHING THE IRON CARBONYL CONTENT OF A RECYCLE GAS STREAM

Richard P. Ruskan, Houston, Tex.; Humayon Z. Zafar, Wichita, Kans.; Duane N. Goens, Golden, Colo.; David E. Hyatt, Wheatridge, Colo., and Charlie W. Kenney, Lakewood, Colo., assignors to Pentanyl Technologies, Inc., Boulder, Colo.

Division of Ser. No. 139,422, Apr. 11, 1980, Pat. No. 4,250,157. This application Sep. 29, 1980, Ser. No. 192,415

Int. Cl.³ B01J *3/04, 8/04*

U.S. Cl. 422—188 **15 Claims**



1. An apparatus for enriching the iron carbonyl content of a recycle gas stream comprising residual iron carbonyl and carbon monoxide and produced in an iron carbonyl decomposition or reaction process to enable reuse of the recycle gas stream in the iron carbonyl decomposition or reaction process, comprising:

recycle gas stream splitting means for receiving a recycle gas stream from an iron carbonyl decomposition or reaction process and splitting the gas stream into a first portion and a second portion;

cooler means for cooling the first portion of the recycle gas stream to a temperature of about 5° to about 15° C., thereby condensing at least a portion of the residual iron carbonyl in the gas stream;

carbon monoxide supply means for supplying carbon monoxide to the cooled first portion of the gas stream;

compressor means for compressing the carbon monoxide enriched gas stream to a pressure of about 20 to about 38 atmospheres under conditions suitable to prevent the decomposition of substantial amounts of iron carbonyl in the gas stream;

reaction vessel means containing reduced iron containing material for receiving the gas stream from the compressor means and for providing a reaction chamber wherein the gas stream is contacted with the iron containing material at a temperature of about 65° to about 160° C. at a pressure of about 20 to about 38 atmospheres to produce substantially condensed iron carbonyl;

vaporization means for vaporizing the condensed iron carbonyl;

combination means for combining at least a portion of the vaporized iron carbonyl with the second portion of the recycle gas stream to produce an iron carbonyl enriched recycle gas stream; and

fluid communication means providing fluid communication between the recycle gas stream splitting means, the carbon monoxide supply means, the cooler means, the compressor means, the reaction vessel means, the vaporization means and the combination means.

4,310,491

APPARATUS FOR SUPPLYING RAW LIQUID AND RELIEVING PRESSURE OF HIGH-PRESSURE PRODUCT LIQUID

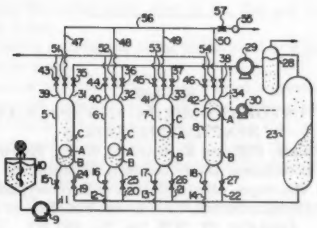
Masakatsu Sakamoto, Matsudo; Kenji Uchida, Kashiwa; Yukishige Kamino, Shimoinayoshi, and Makoto Saito, Minorimachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,511

Claims priority, application Japan, Mar. 5, 1980, 55/26560

Int. Cl.³ B01J *8/00*

U.S. Cl. 422—234 **3 Claims**



1. An apparatus for supplying raw liquid and relieving pressure of high-pressure product liquid, comprising: at least one cylinder provided with a float dividing the space in said cylinder into two working chambers, one of said working chambers being charged with a material slurry at a low pressure, said material slurry being pressurized by the pressure of a high-pressure product slurry formed by a reaction as said high-pressure product slurry is charged into the other working chamber, the pressurized material slurry being forced into a reaction vessel and then said product slurry in the other working chamber is discharged to the ssure, said

material slurry being pressurized by the pressure of a high-pressure product slurry formed by a reaction as said high-pressure product slurry is charged into the other working chamber, the pressurized material slurry being forced into a reaction vessel and then said product slurry in the other working chamber is discharged to the ssure, said

material slurry being pressurized by the pressure of a high-pressure product slurry formed by a reaction as said high-pressure product slurry is charged into the other working chamber, the pressurized material slurry being forced into a reaction vessel and then said product slurry in the other working chamber is discharged to the ssure, said

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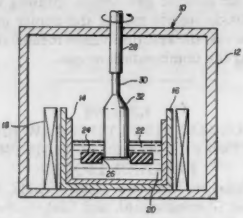
material slurry being pressurized by the pressure of a high-pressure product slurry formed by a reaction as said high-pressure product slurry is charged into the other working chamber, the pressurized material slurry being forced into a reaction vessel and then said product slurry in the other working chamber is discharged to the ssure, said

material slurry being pressurized by the pressure of a high-pressure product slurry formed by a reaction as said high-pressure product slurry is charged

from the group consisting of oxide of yttrium and the lanthanum series elements; 0.5 to 5% by weight of alumi-



num oxide; 0.1 to 2.0% by weight of aluminum nitride and the balance of silicon nitride.

4,310,493

APPARATUS FOR THE MIXING AND APPLICATION OF REACTIVE MATERIALS

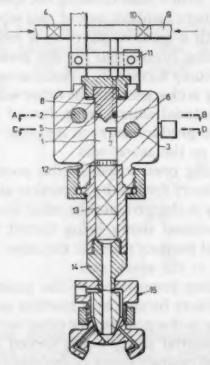
Karl H. Pisaric, Pulheim; Karl-Arnold Weber; Harro Träubel, both of Leverkusen; Dieter Brauner, Solingen, and Manfred H. Pahl, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 11, 1978, Ser. No. 950,352

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1977, 2746188

Int. Cl.[3] B01F *3/04*

U.S. Cl. 422—135 4 Claims



1. An apparatus for mixing a plurality of viscous, rapidly reacting nongaseous fluid materials in two stages comprising a cylindrical mixing chamber having a plurality of inlet portions adapted for the simultaneous admission of the viscous, rapidly reacting, fluid materials and at least one gas inlet portion adapted to be in communication with said mixing chamber at the same time as said fluid inlets, and an outlet opening at the downstream end of the mixing chamber, wherein the first of said plurality of inlet portions and at least one gas inlet portion are arranged so that both the fluid material from this inlet portion and the gas enter approximately tangent to the inside wall of the mixing chamber, and the remainder of said plurality of inlet portions are offset downstream of said first inlet portion, and upstream of a static mixing apparatus which is provided between said inlet portions and said outlet opening.

4,310,494

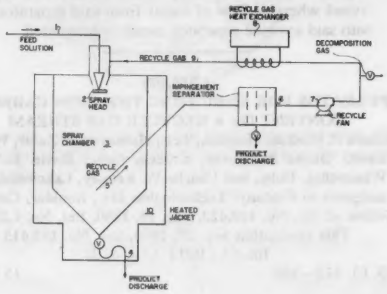
MANGANESE NITRATE SPRAY DECOMPOSITION

Jay Y. Welsh, Catonsville, Md., assignor to Chemetals Corporation, Baltimore, Md.

Continuation of Ser. No. 39,115, May 15, 1979, Pat. No. 4,250,149. This application Dec. 16, 1980, Ser. No. 216,788

Int. Cl.[3] C01G *45/02*

U.S. Cl. 423—49 4 Claims



1. A method for decomposing manganese nitrate in an aqueous solution containing alkali and/or alkaline earth nitrates, comprising the steps of:

(a) spraying said aqueous nitrate solution containing about 0.5 to 0.8 grams of soluble manganese per gram of total alkali and/or alkaline earth compounds to form droplets of solution,

(b) heating said droplets of solution to fully decompose each droplet to form a fluid product slurry containing nonstoichiometric manganese dioxide, nitrogen dioxide and water vapor, and

(c) recovering said fluid product slurry containing nonstoichiometric manganese dioxide.

4,310,495

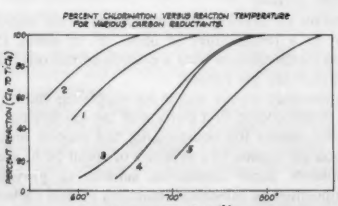
LOW-TEMPERATURE FLUID-BED CHLORINATION OF TITANIFEROUS ORE

James P. Bonsack, Aberdeen, Md., assignor to SCM Corporation, New York, N.Y.

Filed Jul. 2, 1980, Ser. No. 165,252

Int. Cl.[3] C01G *23/02*

U.S. Cl. 423—76 9 Claims



EXAMPLE NUMBER	CARBON TYPE	CARBON SURFACE AREA (m^2/g)
1	TREATED ANTHRACITE (POROUS)	163
2	TREATED ANTHRACITE (POROUS)	680
3	ANTHRACITE (NON POROUS)	0.1
4	BITUMINOUS CHAR (NON POROUS)	0.9
5	PETROLEUM COKE (NON POROUS)	0.3

1. A process for chlorinating a titaniferous material which comprises fluidizing discrete particles of titaniferous material and discrete particles of porous carbon reductant and contacting said discrete particles with a chlorine-providing material at a temperature of between about 600° C. and about 800° C. until

the titanium content of said titaniferous material is substantially chlorinated, said porous carbon reductant is characterized in that it has micropores therein having a pore diameter of less than about 20 A.

4,310,496

PROCESS FOR CONVERTING SILICON DIOXIDE CONTAINING WASTE FLUE DUST TO CRYSTALLINE ZEOLITIC MOLECULAR SIEVES OF TYPE A

Karl Achenbach, Frankfurt, and Günter Türk, Hanau, both of Fed. Rep. of Germany, assignors to DEGUSSA, Frankfurt, Fed. Rep. of Germany

Filed Nov. 8, 1977, Ser. No. 849,613

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651384

The portion of the term of this patent subsequent to Feb. 26, 1997, has been disclaimed.

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—118 **11 Claims**

1. A process for the preparation of crystalline zeolite molecular sieves of type A from waste flue dust containing silicon dioxide obtained from the production of silicon metal or ferrosilicon or is a mixture of flue dusts from the production of silicon metal and ferrosilicon comprising (1) dissolving the flue dust in alkali metal hydroxide solution with the formation of alkali metal silicate solution having the mole ratio (SiO_2:Me_2^IO) in the range of 2.0:1 to 3.5:1 at a temperature of 60°–110° C.; (2) purifying the thus obtained alkali metal silicate solution from organic constituents by treatment with both activated carbon and sodium peroxide and separating the non-decomposable residue from the solution; and (3) reacting alkali metal aluminate solution present at room temperature with the purified alkali metal silicate solution with the mole ratio (SiO_2:Me_2^IO) of 2.0:1 to 3.5:1 obtained by steps (1) and (2) and subsequently crystallizing the reaction mixture ((2.0–4.4-)Me_2^IO:Al_2O_3:(1.3–1.8)SiO_2:(90–120)H_2O) at a temperature of 90°–96° C. for a period of 6–12 hours, subsequently filtering to remove the product from the mother liquor, washing the product to pH of about 10–11 and drying to recover a crystalline, zeolite molecular sieve of type A having a degree of whiteners according to BERGER at 460μ in the range of 90–95%, the alkali metal of the hyroxide, silicate, and aluminate being sodium or potassium.

4,310,497

PROCESS FOR PURIFYING A HYDROGEN SULFIDE CONTAINING GAS

Andre Deschamps, Noisy le Roi; Claude Dezael, Maisons Laffitte; Sigismond Franckowiak, Rueil Malmaison, and Henri Gruhier, Chatillon/Bagneux, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation-in-part of Ser. No. 149,815, May 15, 1980, abandoned. This application Jan. 30, 1981, Ser. No. 230,174

Claims priority, application France, May 15, 1979, 79 12542

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—230 **10 Claims**

1. A process for purifying a gas containing hydrogen sulfide, comprising the steps of:

(a) passing a mixture of said gas with oxygen in contact with the regenerated contact mass of step (b) at a temperature of 20° to 170° C., said contact mass comprising carbon and a metal compound selected from an iron oxide, a copper oxide, an iron sulfate and a copper sulfate and having a specific surface of at least 50 m2/g, the molar ratio of oxygen to hydrogen sulfide being at least 0.5:1, thereby converting hydrogen sulfide essentially to sulfur which remains in the contact mass,

(b) periodically passing an oxygen-containing gas through said contact mass at a temperature from 200° to 300° C. and recovering an effluent gas containing sulfur dioxide, thereby regenerating said contact mass for subsequent use in the above step (a).

4,310,498

TEMPERATURE CONTROL FOR DRY SO_2 SCRUBBING SYSTEM

Khaldoun W. Malki, and Edward J. Angelini, both of Birmingham, Ala., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 24, 1980, Ser. No. 143,201

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—242 **2 Claims**

1. An improved method for removing sulfur oxides from a flue gas produced during the combustion of a sulfur-bearing fossil fuel of the type wherein the flue gas is progressively passed through an air heater, a spray dryer wherein a spray of sulfur oxide absorbent slurry contacts the flue gas and reacts with the sulfur oxides in the flue gas so that a portion of the sulfur oxides are absorbed therefrom in the form of a dry particulate sulfur compound, and a particulate collector wherein the dry particulate sulfur compound is collected before the flue gas is released to the atmosphere; the improvement comprising the steps of:

a. sensing the sulfur oxide level in the flue gas leaving the spray dryer;

b. comparing said sensed sulfur oxide level to a preselected emission level;

c. whenever said sensed sulfur oxide level is greater than the preselected emission level spraying greater amounts of sulfur oxide absorbent slurry into the flue gas passing through said spray dryer so as to cause the sulfur oxide level in the flue gas leaving the spray dryer to drop below the preselected emission level;

d. sensing the temperature of the flue gas leaving the spray dryer;

e. comparing said sensed temperature to a preselected temperature above the adiabatic saturation temperature of the flue gas; and

f. simultaneously with step c. increasing the temperature of the flue gas entering the spray dryer so as to maintain the temperature of the flue gas leaving the spray dryer at said preselected temperature and above the adiabatic saturation temperature of the flue gas said step of increasing the temperature of the flue gas entering the spray dryer comprising bypassing a portion of the flue gas around the air preheater and remixing said bypassed portion with the remainder of the flue gas before passing the remixed flue gases through the spray dryer, the bypassed portion being sufficient to maintain the temperature of the flue gas entering the spray dryer at a temperature sufficient to maintain the temperature of the flue gas leaving the spray dryer at a preselected temperature above the adiabatic saturation temperature of the flue gas.

4,310,499

PROCESS FOR PRODUCING SIALON SINTERED PRODUCT

Mamoru Mitomo, Sakura; Nobuyuki Kuramoto, Tsuchiura, and Yoshizo Inomata, Sakura, all of Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

Continuation of Ser. No. 70,626, Aug. 29, 1979, abandoned. This application Dec. 12, 1980, Ser. No. 215,662

Int. Cl.³ C01B *21/00*; C04B *35/14*

U.S. Cl. 423—327 **4 Claims**

1. A process for producing SIALON sintered product having the formula

$$Si_{6-z}Al_zO_zN_{8-z}$$

(z is 0 to 4.2) which comprises sintering a molded product of the starting materials for SIALON selected from the group consisting of

(i) a mixture of powdery components of Si_3N_4, Al_2O_3 and AlN; and

(ii) a mixture of powdery components of Si_3N_4, SiO_2 and AlN;

in the condition of covering the surface of said molded product with a mixed powder consisting essentially of Si_3N_4 and SiO_2 in nitrogen gas atmosphere.

4,310,500

METHOD FOR REMOVING VOLATILE AROMATIC COMPOUNDS

Gerhard Langecker, Cologne; Hans-Jurgen Gebauer, Troisdorf, and Heinrich Hermann, Cologne, all of Fed. Rep. of Germany, assignors to Josef Meissner GmbH & Co., Cologne, Fed. Rep. of Germany

Filed May 1, 1980, Ser. No. 145,637

Claims priority, application Fed. Rep. of Germany, May 26, 1979, 2921487

Int. Cl.³ C07C *79/10*

U.S. Cl. 423—345 **4 Claims**

1. In the nitration of a volatile aromatic compound wherein (a) the compound is reacted with an aqueous nitrating agent comprising sulfuric acid and nitric acid thereby to effect nitration and to produce a waste gas containing some of the aromatic compound, nitrogen oxides and nitric acid, the improvement which comprises (b) contacting the waste gas in a gas absorber with fresh nitrating agent thereby to remove the aromatic compound from the gas into the nitrating agent, and thereafter passing such nitrating agent to (a) to effect nitration of fresh feed.

4,310,501

PROCESS FOR PRODUCING HYDROGEN FLUORIDE

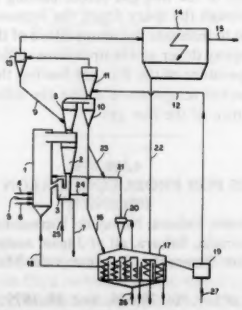
Lothar Reh; Hans W. Schmidt; Harald Sauer, all of Frankfurt am Main; Günter Winkhaus, Königswinter; Roland Thome, Bonn, and Dieter Moritz, Lünen, all of Fed. Rep. of Germany, assignors to Metallgesellschaft A.G., Frankfurt am Main and Vereinigte Aluminium Werke A.G., Bonn, both of, Fed. Rep. of Germany

Filed Jul. 9, 1980, Ser. No. 166,917

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1979, 2928368

Int. Cl.³ C01B *7/19*

U.S. Cl. 423—484 **3 Claims**



1. A method of producing hydrogen fluoride which comprises the steps of:

(a) subjecting a fluorine-containing material to pyrohydrolysis in an expanded fluidized bed to produce a hot HF-containing gas and entraining material from said fluidized bed in said gas;

(b) separating the material entrained in said hot HF-containing gas therefrom and recycling said material to said fluidized bed;

(c) shock cooling the hot HF-containing gas by direct contact thereof with solids at a lower temperature than that of said hot HF-containing gas in a suspension-type heat exchanger whereby the gas is cooled for removal of HF therefrom and the solids are heated;

(d) displacing the hot solids to a fluidized-bed cooler and cooling said solids with recovery of sensible heat therefrom; and

(e) recycling at least part of the cooled solids from step (d) to step (c).

4,310,502

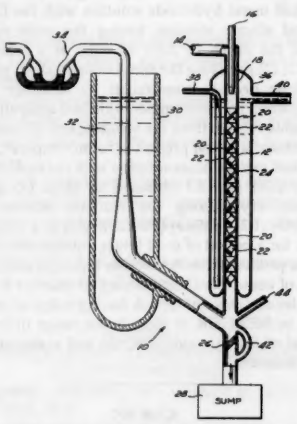
SINGLET DELTA OXYGEN GENERATOR AND PROCESS

Ross I. Wagner, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 29, 1980, Ser. No. 154,268

Int. Cl.³ C01B *13/00*

U.S. Cl. 423—579 **16 Claims**



1. A singlet delta oxygen generator, comprises:

a static mixer having a liquid inlet, a gas inlet, a plurality of left and right-hand helical mixing elements, arranged in alternating sequence, and a product exit zone;

a liquid gas separator, oriented across said exit zone of said static mixer so that said liquid may be transferred through said separator while the gaseous product stream is diverted away from said liquid by-product; and

a low-volume trap for freezing water and hydrogen peroxide vapor contained in said gaseous product stream.

10. A process for generating singlet delta oxygen comprises the steps of:

preparing a solution from 50% aqueous sodium hydroxide and 90% aqueous hydrogen peroxide;

combining said solution with chlorine gas in a static mixer having a liquid inlet, a gas inlet, a plurality of left and right-hand helical mixing elements, arranged in alternating sequence, and a product exit zone;

reacting said sodium hydroxide, hydrogen peroxide and said chlorine gas so as to generate singlet delta oxygen;

passing the reaction products through a liquid/gas separator so as to create a liquid free gaseous product; and

conveying said liquid-free gaseous product to a low-volume trap so as to freeze separate water and hydrogen peroxide vapor from said singlet delta oxygen product.

4,310,503

HYDROGEN PRODUCTION BY MULTISTAGED INTERMEDIATE OXIDATION-REDUCTION

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed Mar. 21, 1975, Ser. No. 560,342
Int. Cl.[3] C01B *1/08*
U.S. Cl. 423—657 4 Claims

1. A process for generating a mixture of hydrogen and steam from a supply of steam and a carbonaceous reducing composition which comprises:

a. establishing a first and at least a second nongaseous intermediate capable of exchanging chemically bound oxygen with H_2O and CO_2, wherein the intermediates are arranged in order of increasing equilibrium pH_2/pH_2O values, whereby the equilibrium pH_2/pH_2O value of the first nongaseous intermediate is lower than the equilibrium pH_2/pH_2O value of the second nongaseous intermediate, and wherein the temperature and pressures of all the intermediates are maintained in the range of 700° K.–1300° K. and 1 to 500 atmospheres, and wherein at least one of the intermediates is tin, indium, molybdenum, or WO_2 and at least one other of the intermediates is molybdenum, WO_2, Fe, FeO, or tin, wherein the tin is dissolved in Cu, Pb, or Bi and wherein the solution containing the dissolved tin contains additionally a second dissolved liquid intermediate;

b. routing the supply of steam such that it sequentially contacts so as to react with the nongaseous intermediates in order of increasing equilibrium pH_2/pH_2O values, whereby part of the steam is converted to hydrogen during contact with the first nongaseous intermediate, and an additional part is converted to hydrogen during contact with each subsequent nongaseous intermediate, and whereby part of each nongaseous intermediate is oxidized;

c. collecting the resulting mixture of hydrogen and steam;

d. routing the carbonaceous reducing composition such that it sequentially contacts so as to react with the oxidized nongaseous intermediates in order opposite to the order in which they were contacted with the steam, whereby each of the nongaseous intermediates is regenerated for reuse.

4,310,504

DRY RADIOIMMUNOASSAY TEST COMPOSITION CONTAINING STABILIZED LABEL/ANTIBODY MIXTURE

Sara Derfler; Yehuday Tamir, both of Jerusalem, Israel, and Daniel B. Wagner, Raleigh, N.C., assignors to Ames-Yissum Ltd., Jerusalem, Israel

Filed Sep. 12, 1979, Ser. No. 75,060
Claims priority, application Israel, Sep. 13, 1978, 55564
Int. Cl.[3] G01N *33/48*; G01T *1/00*; B65D *71/00*
U.S. Cl. 424—1 19 Claims

1. A method for preparing a dry radioimmunoassay test composition comprising a mixture of (i) a radiolabelled form of a ligand selected from haptens and antigens and (ii) an antibody for said ligand, wherein substantially all of said radiolabelled ligand is not bound to said antibody in said mixture, which method comprises the steps of:

(a) preparing an aqueous liquid mixture of said radiolabelled ligand, said antibody, and a heavy metal cation present in an amount sufficient to inhibit substantially the complex-forming reaction between said radiolabelled ligand and said antibody, and

(b) drying said liquid mixture.

4,310,505

LIPID VESICLES BEARING CARBOHYDRATE SURFACES AS LYMPHATIC DIRECTED VEHICLES FOR THERAPEUTIC AND DIAGNOSTIC SUBSTANCES

John D. Baldeschwieler; Ronald C. Gamble, both of Pasadena, Calif.; Marcia R. Mauk, Vancouver, Canada; Tsung-Ying Shen, Westfield, and Mitree M. Ponpipom, Branchburg, both of N.J., assignors to California Institute of Technology, Pasadena, Calif.

Filed Nov. 8, 1979, Ser. No. 92,342
Int. Cl.[3] A61K *49/00, 43/00*; B01J *13/00*
U.S. Cl. 424—1 8 Claims

1. Phospholipid vesicles comprising a lipid bilayer which includes:

a cell-surface receptor selected from synthetic sugar and amino sugar derivatives of cholesterol, and

cholesterol, and

an effective amount of physiologically compatible radioactive tracer, cytotoxic or therapeutic agent as a part of the vesicles.

4,310,506

MEANS OF PREPARATION AND APPLICATIONS OF LIPOSOMES CONTAINING HIGH CONCENTRATIONS OF ENTRAPPED IONIC SPECIES

John D. Baldeschwieler; Ronald C. Gamble, both of Pasadena, Calif., and Marcia R. Mauk, Vancouver, Canada, assignors to California Institute of Technology, Pasadena, Calif.

Continuation-in-part of Ser. No. 13,914, Feb. 22, 1979, abandoned. This application Feb. 20, 1980, Ser. No. 123,162
Int. Cl.[3] A61K *49/00, 43/00*; B01J *13/00*
U.S. Cl. 424—1 32 Claims

1. Vesicles comprising a lipid bilayer, an ionophore being incorporated in said lipid bilayer, a chelating agent entrapped within the vesicles, and an effective amount of physiologically compatible cation bound to said chelating agent within the vesicles.

4,310,507

CONTRAST AGENT FOR RADIOGRAPHY

George W. Luckey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 930,289, Aug. 2, 1978, abandoned. This application Apr. 17, 1980, Ser. No. 141,030
Int. Cl.[3] A61K *49/04*
U.S. Cl. 424—4 11 Claims

1. A radiographic contrast composition comprising a radiographically effective amount of a lanthanide phosphate as a contrast agent and a carrier for said agent, wherein said carrier is a natural or synthetic polymer binder and said composition is in dry tablet form.

4,310,508

DIAGNOSTIC TEST AND REAGENT THEREFOR

George R. Siber, 37 Corey Rd., Brookline, Mass. 02146

Filed Jun. 19, 1979, Ser. No. 50,269
Int. Cl.[3] G01N *1/28, 33/48, 33/54*
U.S. Cl. 424—12 14 Claims

1. A reagent for the detection of antigens in body fluids suspected of containing such antigens as well as heat labile and heat stable agglutinins, which comprises a suspension of finely divided particles having absorbed thereon antibody against such antigens and a buffer system including a mixture of a polyanion capable of minimizing the effects of heat labile agglutinins in the body fluid and a reducing agent capable of minimizing the effects of heat stable agglutinins in the body fluid.

5. In a direct agglutination method for the detection of antigens in body fluids suspected of containing such antigens as well as heat labile and heat stable agglutinins, which method comprises preparing a reaction mixture by mixing a specimen of such body fluid with a liquid reagent comprising carrier

particles coated with animal antiserum or an immunoglobulin fraction thereof against such antigens suspended in a compatible physiological buffering system, the improvement which comprises adding to the reaction mixture a buffer system which includes a polyanion capable of minimizing the effects of heat labile agglutinins in the specimen and a reducing agent capable of minimizing the effects of heat stable agglutinins in the specimen and which permits recognition of a positive specific reaction with the antigen and avoids a positive non-specific reaction.

11. A method for detecting polyribophosphate (PRP) in a specimen of body fluid suspected of containing the same as well as heat labile and heat stable agglutinins which comprises forming a reaction mixture by mixing reagent comprising an aqueous suspension of finely divided particles having absorbed thereon antibody specific to PRP, said antibody being derived from an equine species immunized with PRP, with a specimen of said body fluid and a buffer system including a polyanion and a reducing agent capable of minimizing the effects of heat labile and heat stable agglutinins respectively, incubating said reaction mixture and thereafter determining the presence of agglutination, the presence of agglutination indicating the presence of PRP in the specimen of body fluid.

4,310,509

PRESSURE-SENSITIVE ADHESIVE HAVING A BROAD SPECTRUM ANTIMICROBIAL THEREIN

Claire A. Berglund, Shoreview, Minn., and Paul D. Rosso, St. Joseph Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 31, 1979, Ser. No. 62,363

Int. Cl.³ A61K *9/70;* **A61F** *13/00;* **A61L** *15/03;* **A61K** *33/18*

U.S. Cl. 424—28 **11 Claims**

1. A process for making a dermatologically acceptable composition which controllably releases an antiseptically active broad-spectrum antimicrobial agent when placed in contact with skin comprising forming a solution of a broad-spectrum antimicrobial agent; forming a room temperature tacky pressure-sensitive adhesive which is compatible with said broad-spectrum antimicrobial agent; mixing said antimicrobial agent solution and said pressure-sensitive adhesive such that the broad-spectrum antimicrobial agent from said antimicrobial agent solution is homogeneously dispersed in said pressure-sensitive adhesive; and drying said homogeneous dispersion so as to remove said solvents leaving an antiseptically active amount of said broad-spectrum antimicrobial agent homogeneously and stably dispersed in said pressure-sensitive adhesive.

4,310,510

SELF ADMINISTRABLE ANTI-FERTILITY COMPOSITION

Kenneth N. Sherman, 135 Heather La., Wilton, Conn. 06897, and Arnold Jacobson, 53 E. Altarinda Dr., Orinda, Calif. 94563

Division of Ser. No. 754,737, Dec. 27, 1976, Pat. No. 4,252,787, which is a continuation-in-part of Ser. No. 642,797, Dec. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 430,645, Jan. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 225,591, Feb. 11, 1972, abandoned. This application Oct. 3, 1980, Ser. No. 193,628

Int. Cl.³ A61K *9/02, 9/12*

U.S. Cl. 424—45 **16 Claims**

1. A self-administrable antifertility composition comprising a progestational compound for topical non-systemic application to the cervix in an amount effective for alteration of cervical mucous secretions in a manner unfavorable to fertility and a non-rigid pharmaceutically acceptable viscous gel, cream, foam or effervescent type suppository vehicle which is sufficiently viscous to keep the progestational compound in effective contact with the cervical tissue for sufficient time to bring about the desired modification of the cervical mucous secretions when formulated for self-administrable use, care being taken that the carrier is not so viscous that administration becomes difficult and the contact time required between the reactive progestational ingredient and the cervical tissue becomes overly long for the effective dose to be administered, said vehicle excluding solid or rigid type ampoules or capsules as well as liquid carriers and ordinary suppositories which have an undesirable propensity to flow and run out of the vagina, said progestational compound being contained in said vehicle in a concentration selected according to the progestational compound and the dosage quantity and schedule so as to apply to the cervix substantially only a non-systemic quantity of the progestational compound to produce substantially only a local effect without changing in significant measure the amount of said compound in the blood stream of the user and thereby without generating side effects resulting from increased blood levels in the user of said progestational compound.

4,310,511

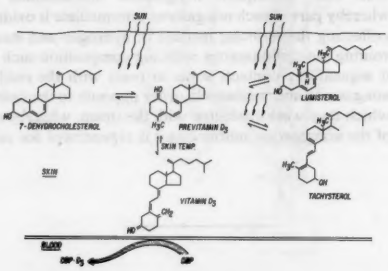
SUNSCREEN COMPOSITIONS CONTAINING $\Delta^{5,7}$ STEROIDAL DIENES

Michael F. Holick, Sudbury, Mass., assignor to Massachusetts General Hospital, Boston, Mass.

Filed Oct. 2, 1980, Ser. No. 193,297

Int. Cl.³ C07J *7/00;* **A01N** *45/00;* **A61K** *7/42, 7/44*

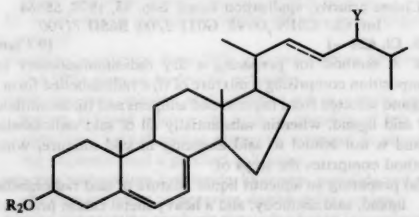
U.S. Cl. 424—59 **8 Claims**



1. A sunscreening composition which comprises:

a sunscreening amount of an opacifying agent having substantial absorbance at 250–320 nm; and

0.01–50% by weight of the total composition of a substituted or unsubstituted $\Delta^{5,7}$ steroidal diene which is nonhydroxylated at any of positions 1; 1,25; 1, 24, 25 and 1, 25, 26 thereof; and having the formula:



wherein Y is hydrogen or lower alkyl or acyl;

R_2 is hydrogen or an acyl or carbonate group; and the bond between carbons 22 and 23 can be single or double.

4,310,512

DERIVATIVES OF ACETIC AND PROPIONIC ACIDS, COMPOSITIONS CONTAINING SAME AND USE AS MALODOR COUNTERACTANTS

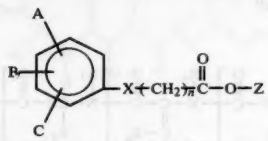
Alfred A. Schleppnik, St. Louis, Mo., assignor to Bush Boake Allen Inc., Norwood, N.J.

Continuation of Ser. No. 828,374, Aug. 29, 1977, abandoned. This application Dec. 4, 1979, Ser. No. 99,993

Int. Cl.³ A61L *13/00*

U.S. Cl. 424—76 **29 Claims**

1. A fragrance composition having malodor counteractant properties comprising (i) a compound having malodor counteractant properties in an effective amount to counteract malodors and (ii) a plurality of fragrance materials in an effective amount to provide a fragrance; said compound (i) having the formula



wherein

A, B and C individually represent hydrogen or an alkyl group of 1 to 6 carbon atoms provided that the total combined number of carbon atoms of A, B, C does not exceed 8 carbon atoms:

X is 0;

n represents 1 to 2; and

Z represents a monohydroxy alkyl group of 2 to 7 carbon atoms.

4,310,513

METHOD OF PROCESSING AN ACTIVE PRINCIPLE OF A HYDROPHOBIC MEDICAMENT AND PRODUCT THEREOF

Robert M. Fauve, Sevres, France, assignor to Institut Pasteur, Paris, France

Continuation of Ser. No. 804,506, Jun. 8, 1977, abandoned, which is a continuation of Ser. No. 539,533, Jan. 8, 1975, abandoned. This application Jun. 6, 1980, Ser. No. 156,914

Claims priority, application France, Jan. 10, 1974, 74 00842

Int. Cl.³ A61K *31/79, 47/00, 39/02*

U.S. Cl. 424—80 **17 Claims**

1. A dry solid containing particles of a hydrophobic medicament dispersed within a matrix wherein the medicament

is insoluble in an aqueous physiological solution

is capable of being in the form of particles having a size greater than that suitable for injection

is reducible to particle size, less than 20 microns for use as an injectable powder by milling or homogenization

said fine particles being prone to irreversible agglomeration

said matrix is formed of a water-soluble organic non-antigenic constituent

said non-antigenic constituent and said medicament are in a weight ratio of at least 5 and

said medicament particles are individualized and embedded within said matrix to such an extent as to be releasable within an aqueous medium by solubilization of said non-antigenic constituent in an aqueous medium when said solid is contacted with an aqueous solution to form an injectable suspension of individualized particles of said medicament.

4,310,514

IMMUNOLOGICALLY ACTIVE DIPEPTIDYL 5-0,6-0-ACYL-2-AMINO-2-DEOXY-D-GLUCOFURANOSE DERIVATIVES AND METHODS OF PREPARATION

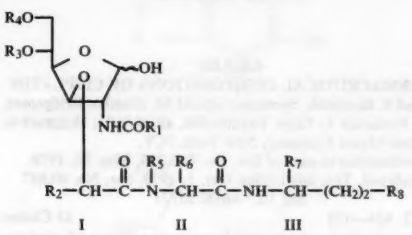
Philippe L. Durette, New Providence, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed May 5, 1980, Ser. No. 146,806

Int. Cl.³ A61K *39/00, 37/02;* **C07C** *103/52*

U.S. Cl. 424—88 **10 Claims**

1. Dipeptidyl 5-O, 6-O-acyl-2-amino-2-deoxy-D-glucofuranoses of the general structural formula:



(I.)

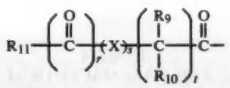
wherein

R_1 is C_{1-7} alkyl, substituted C_{1-7} alkyl; phenyl; or substituted phenyl;

wherein the substituent is one or more alkyl groups of 1–3 carbon atoms or hydroxy or mercapto groups either free, or esterified by an alkyl group of 1–3 carbons or esterified by an acid of 1–4 carbons, lower ($1–4_C$) alkyldioxy cycloalkyldioxy of 5–7 carbon atoms, amino, trifluoromethyl, halo, or phenyl;

R_2 is hydrogen; or C_{1-10} alkyl;

R_3 and R_4 may be the same or different and are each independently acyl of the formula:



where

X is —O—, —S—, or

R_9, R_{10}, and R_{12} may be the same or different and are each independently hydrogen; C_{1-20} alkyl; C_{1-20} alkylcarbonyloxy; amino; benzyl; C_{1-20} alkoxymethyl; or C_{1-20} alkylamido;

r is 0 or 1; s is 0 or 1; and t is 0–20, provided that s may only be 0 when r and t are greater than 0, or when r is 0 and R_{11} is amino, phenyl, substituted phenyl, 1-adamantyl, or heterocycle selected from the group consisting of 2- or 3-furyl, 2- or 3-thienyl, 2- or 3-pyrrolidinyl, 2-, 3-, or 4-pyridyl, and 1-tetrazolyl, said heterocycle optionally substituted with C_{1-20} alkylcarbonyl; and

R_{11} is hydrogen; C_{1-30} alkyl; C_{2-30} alkenyl; C_{1-30} alkoxy; phenyl; C_{1-20} alkylsulfonyl; or cholesteryl; and

R_4 may additionally be hydrogen;

R_5 is hydrogen; or R_5-R_6 together is —CH_2—CH_2—CH_2;

R_6 is hydrogen; C_{1-7} alkyl; hydroxymethyl; mercaptomethyl; benzyl; or substituted benzyl;

R_7 and R_8 may be the same or different and are each independently COOR or CONR'R", where R is hydrogen or C_{1-7} alkyl, and R' and R" are each independently hydrogen or C_{1-3} alkyl;

when R_2 is C_{1-10} alkyl, the stereochemistry at asymmetric center I can be either D or L;

when R_6 is not hydrogen, the stereochemistry at asymmetric center II is L; the stereochemistry at asymmetric center III is D.

5. A composition comprising a compound of claim 1 present in an amount effective to produce an immunostimulatory effect and a vaccine against bacterial, viral or parasitic infections or against tissue antigens of normal or pathogenic origin.

4,310,515

PHARMACEUTICAL COMPOSITIONS OF CISPLATIN

Edmund S. Granatek, Syracuse; Gerald M. Ziemba, Bridgeport, and Frederick L. Grab, Fayetteville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 910,325, May 30, 1978, abandoned. This application Oct. 1, 1979, Ser. No. 80,857

Int. Cl.³ A61K *33/24*

U.S. Cl. 424—131 **13 Claims**

7. An injectable, stable, sterile aqueous solution of cisplatin in a unit dosage form in a sealed container, said solution being suitable for administration by the injection thereof into man upon the removal thereof from said container, said solution having a concentration of cisplatin of about 1.0 mgm./ml. and a pH in the range of 2.3 to 2.7, said pH being caused by the presence of the appropriate amount of hydrochloric acid, said solution containing in addition a nontoxic, pharmaceutically acceptable, inorganic source of chloride ions in a concentration equivalent to that produced by the presence of sodium chloride in a concentration in the range of 1 to 20 mgm./ml.

4,310,516

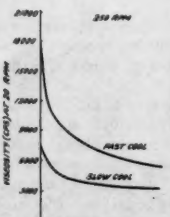
COSMETIC AND PHARMACEUTICAL VEHICLE THICKENED WITH SOLID EMULSIFIER

Tiang-Shing Chang, Westfield, and Lucy J. Zientek, Bayonne, both of N.J., assignors to Block Drug Company Inc., Jersey City, N.J.

Filed Feb. 1, 1980, Ser. No. 117,443

Int. Cl.³ A61K *33/30, 31/245, 47/00*

U.S. Cl. 424—145 **5 Claims**



1. A method of preparing an anhydrous pseudoplastic and thixotropic oleaginous vehicle which comprises cooling at a rate of about 0.5° to 30° C./min. a mixture of at least one solid at ambient temperature emulsifying agent whose HLB is not in excess of 12 with at least one oleaginous material selected from the group consisting of mineral oil, fatty acid, and fatty alcohol, with agitation, over a temperature range of at least about 15° C., said range encompassing the pour point of said agent.

4,310,517

TUMOR-RESOLVING AND HISTOLYTIC MEDICAMENTS AND THEIR USE

Eugen Etschenberg; Wolfgang Opitz, and Siegfried Raddatz, all of Cologne, Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co., KG, Cologne, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 862,896, Dec. 21, 1977, abandoned. This application Oct. 9, 1979, Ser. No. 82,450

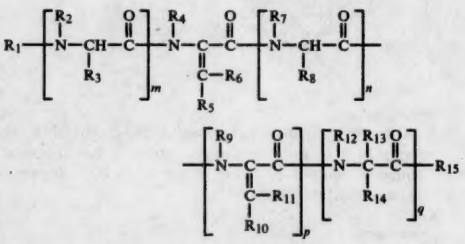
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1976, 2659154; Oct. 11, 1977, 2745673

The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 **14 Claims**

1. A pharmaceutical composition containing as an active ingredient an effective amount of 1 to 100 mg of a compound which is a dehydrooligopeptide of the following general formula or its salt



in which

R_1 is hydrogen; alkanoyl having from 2 to 6 carbon atoms; benzoyl or naphthoyl each unsubstituted or substituted by from 1 to 3 halogen atoms or by trifluoromethyl; heteroaryl having from 5 to 7 ring members and containing from 1 to 3 hetero-atoms which are the same or different and each of which is nitrogen, sulfur or oxygen and on which there is a carbonyl group;

each of R_2, R_7 and R_{12} is a hydrogen;

each of R_3, R_8 and R_{13} is hydrogen; straight chain or branched alkyl having from 1 to 6 carbon atoms; phenylalkyl having from 1 to 4 carbon atoms, unsubstituted or substituted by one or more halogen atoms, nitro, hydroxyl, methoxy or alkyl having from 1 to 4 carbon atoms;

each of R_4 and R_9 is hydrogen;

each of R_5, R_{10} and R_{14} is hydrogen or alkyl having from 1 to 6 carbon atoms;

R_7 and R_8, taken together, form a divalent alkylene chain having three or four carbon atoms;

each of R_6 and R_{11} is phenyl or naphthyl, unsubstituted or substituted by halogen atoms;

a heterocyclic radical having from 5 to 7 ring members and 1 to 2 hetero-atoms each of which is nitrogen, sulphur or oxygen, and is unsubstituted or substituted by halogen atoms or by nitro; or alkyl having from 1 to 6 carbon atoms; R_6 taken together with R_5 and the carbon atoms, at the double bond, linking them, form, a cycloalkylidene or cycloalkylidene ring, having from 3 to 7 carbon atoms; and

R_{15} is hydroxyl, hydrazinyl which is unsubstituted or substituted by lower alkyl, straight-chain or branched, mono or di-(alkyl- or alkenyl-) amino having from 1 to 6 carbon atoms in each alkyl or alkenyl moiety and is unsubstituted or substituted by amino, lower mono- or dialkylamino;

m, n, p and q are the same or different and each represents a figure 0 or 1, with the proviso that m, n, p and q may not all be 1 at the same time and an inert pharmaceutical carrier.

4,310,518

CYCLIC HEXAPEPTIDE SOMATOSTATIN ANALOGS

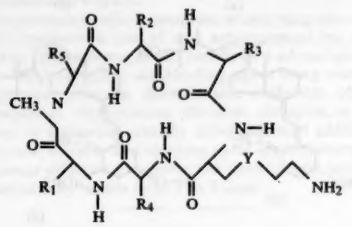
Roger M. Freidinger, Hatfield, and Daniel F. Veber, Ambler, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 161,704, Jun. 23, 1980, which is a continuation of Ser. No. 89,828, Oct. 31, 1979, abandoned. This application Oct. 1, 1980, Ser. No. 192,776

Int. Cl.³ A61K *37/00*; C07C *103/52*

U.S. Cl. 424—177 10 Claims

1. A compound having the formula:



wherein

Y is $(CH_2)_m$ wherein m is 0, 1 or 2 or sulfur;

R_1 and R_2 are independently lower alkyl, benzyl, substituted benzyl wherein the substituent may be one or two of loweralkyl, halogen, hydroxy, amino, nitro or loweralkoxy; and loweralkyl substituted with a 5- or 6-membered heterocyclic ring;

R_3 is 3-indolylmethyl or substituted 3-indolylmethyl wherein the substituent may be loweralkyl, loweralkoxy or halogen;

R_4 is loweralkyl, hydroxyloweralkyl, benzyl, carboxyloweralkyl, aminoloweralkyl or substituted hydroxy benzyl wherein the substituent may be loweralkyl, loweralkoxy, hydroxy, halogen, amino or nitro; and

R_5 is hydrogen, loweralkyl, benzyl, or substituted benzyl wherein the substituent is loweralkyl, loweralkoxy, hydroxy, halogen, amino or nitro.

4,310,519

NOVEL SUBSTANCES AND PROCESS FOR THEIR PRODUCTION

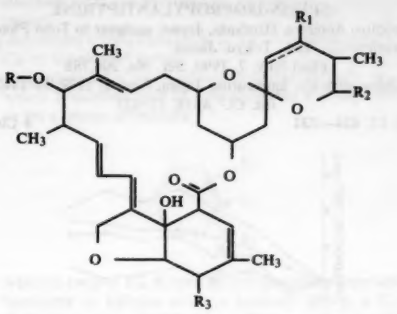
George Albers-Schonberg, Princeton; Hyman Wallick, Springfield; Robert E. Ormond, Edison; Thomas W. Miller, Carteret, and Richard W. Burg, Murray Hill, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 874,607, Feb. 2, 1978, abandoned, which is a continuation-in-part of Ser. No. 772,601, Mar. 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 678,328, Apr. 19, 1976, abandoned. This application Sep. 8, 1978, Ser. No. 940,682

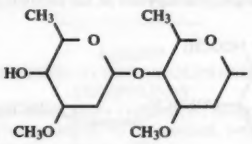
Int. Cl.³ A61K *31/71*; C07H *17/08*

U.S. Cl. 424—181 14 Claims

1. A compound having the formula:



wherein R is:



and wherein the broken line indicates a single or a double bond; R_1 is hydroxy and is present only when said broken line indicates a single bond;

R_2 is iso-propyl or sec-butyl; and

R_3 is methoxy or hydroxy.

10. A composition useful for the treatment of parasitic diseases which comprises an inert carrier having a pharmaceutically effective amount of one or more of the compounds of claim 1 incorporated therein.

4,310,520

SOLIDIFIED EMULSIFIABLE CONCENTRATE AND METHOD FOR APPLICATION THEREOF

Mitsutoshi Narazaki, Amagi, Japan, assignor to Mikasa Chemical Industry Company, Limited, Fukuoka and Mitsubishi Chemical Industries Limited, Chiyoda, both of, Japan

Continuation-in-part of Ser. No. 927,337, Jul. 24, 1978, abandoned. This application Jul. 30, 1979, Ser. No. 62,106

Claims priority, application Japan, Jul. 30, 1977, 52-91920; Rep. of Korea, Oct. 28, 1977, 2492/1977

Int. Cl.³ A01N *25/00, 31/08, 47/10, 57/00*

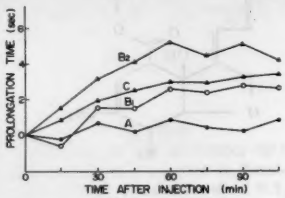
U.S. Cl. 424—200 18 Claims

1. A solidified emulsifiable concentrate for agricultural or sanitary use, which comprises: powdered cellulose having the ability to absorb 2 to 3 times its weight in water, 90% of said powdered cellulose having a particle size of up to 177μ and a liquid mixture which is occluded in the powdered cellulose, said liquid mixing being formed by mixing an agriculturally or sanitary active ingredient sparingly soluble or totally insoluble in water or aqueous solution, in an organic solvent which has the capability of dissolving said active ingredient so that said active ingredient can be absorbed by said cellulose with an emulsifier mixture comprising alkylbenzene sulfonate and at least one nonionic surfactant selected from the group consisting of polyoxyalkylene alkylenearyl ether, polyoxyalkylene alkyl ether, polyoxyalkylene aryl ether, polyoxyalkylene alkylaryl ether, polyoxyalkylene aryl ether polymer and polyoxyalkylene sorbitan alkylate, the amount of said alkylbenzene sulfonate being 30 to 60% by weight in said emulsifier mixture, in an effective quantity sufficient to enable said active ingredient or aqueous solution thereof to be stably emulsified in water when said concentrate is mixed with water with the proviso that if said active ingredient is liquid, the organic solvent may be excluded.

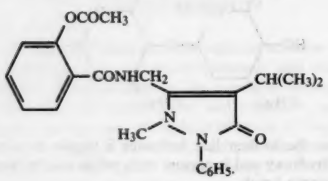
4,310,521
ASPIRIN-ISOPROPYLANTIPYRINE

Shinichiro Aonuma, Hirakata, Japan, assignor to Toho Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Nov. 7, 1980, Ser. No. 204,788
Claims priority, application Japan, Nov. 9, 1979, 54-144325
Int. Cl.³ A61K *31/625*
U.S. Cl. 424—232 **4 Claims**

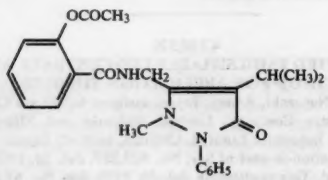


1. Aspirin-isopropylantipyrine of the following formula



(I)

4. A method of treating patients requiring an analgetic, antipyretic or anti-inflammatory treatment, said method being characterized by administering aspirin-isopropylantipyrine of the following formula



(I)

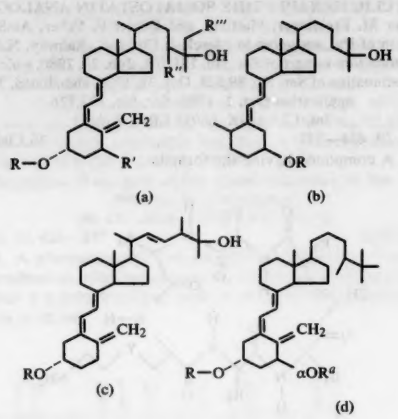
in a dosage of about 0.02 to about 0.08 g/kg-body per day.

4,310,522
CHICKEN FEED COMPOSITION

Fred R. Frank, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 731,814, Oct. 12, 1976, abandoned, which is a continuation of Ser. No. 592,821, Jul. 3, 1975, Pat. No. 4,012,509, which is a continuation of Ser. No. 477,765, Jun. 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 218,480, Jan. 17, 1972, Pat. No. 3,823,237, which is a continuation-in-part of Ser. No. 210,232, Dec. 20, 1971, abandoned. This application Apr. 9, 1980, Ser. No. 138,612
The portion of the term of this patent subsequent to Jul. 9, 1991, has been disclaimed.
Int. Cl.³ A61K *31/59*
U.S. Cl. 424—236 **7 Claims**

1. A chicken feed composition for egg-laying hens comprising, in combination with a chicken feed, an effective but nontoxic egg shell thickening amount of a compound selected from the group consisting of:



where R=H, or acyl where acyl is an acyl radical of normal or isomerized alkane carboxylic acid of from 2 to about 8 carbon atoms, inclusive, and R′, R″, and R‴ is H, OH, or acyl wherein acyl is defined as above, but that at least two of R′, R″, and R‴ must be hydrogen and that if R′, R″, or R‴ is OH, then R must be H, if R′, R″, or R‴ is O acyl, acyl defined as above, then R must be the same acyl, and R^a is selected from hydrogen or acyl as defined above and when R^a is hydrogen, R is hydrogen and when R^a is acyl, R is the same acyl, said chicken feed composition having from about 2.5 to about 5.5% calcium by weight.

4,310,523
COMBINED ANTIESTROGENS AND ANTIGONADOTROPICALLY EFFECTIVE ANTIANDROGENS FOR THE PROPHYLAXIS AND THERAPY OF HYPERPLASIA OF THE PROSTATE

Friedmund Neumann, Berlin, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 28,745, Apr. 10, 1979, abandoned. This application Oct. 10, 1980, Ser. No. 195,812
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1978, 2817157
Int. Cl.³ A01N *45/00*; A61K *31/56*
U.S. Cl. 424—240 **16 Claims**

1. A pharmaceutical composition for the prophylaxis or treatment of prostate hyperplasia comprising an antiestrogen which is (Z)-2-[p-(1,2-diphenyl-1-butenyl)-phenoxy]-N,N-dimethylethylamine, 1-(2-[4-(6-methoxy-2-phenyl-3,4-dihydro-1-naphthyl)-phenoxy]-ethyl)-pyrrolidone hydrochloride, 1-[p-(2-diethylaminoethoxy)-phenyl]-2-(p-methoxyphenyl)-1-phenylethanol, tri-(p-anisolyl)-chloroethylene, 1-[p-(β-diethylaminoethoxy)phenyl]-1,2-diphenylchloroethylene, bis(p-acetoxyphenyl)cyclohexylidenemethane, 1-[2-(p-[α-(p-methoxyphenyl)-β-nitrostyryl]-phenoxy)-ethyl]-pyrrolidine, or 11α-methoxy-17α-ethynyl-1,3,5(10)-estratriene-3,17β-diol, and a antigonadotropically effective anti-androgen, in respective amounts such that the combination is effective for prophylaxis or treatment of prostate hyperplasia.

2. The composition of claim 1, further comprising a pharmaceutically acceptable carrier.

4,310,524
TCA COMPOSITION AND METHOD FOR RAPID ONSET ANTIDEPRESSANT THERAPY

Norbert L. Wiech, and Richard C. Ursillo, both of Cincinnati, Ohio, assignors to Richardson-Merrell, Inc., Wilton, Conn.

Filed Apr. 11, 1980, Ser. No. 139,498
Int. Cl.³ A61K *31/33, 31/135*
U.S. Cl. 424—244 17 Claims

1. In a method for treating depression by administering to a patient suffering therefrom an effective antidepressant amount of imipramine or desipramine or a pharmaceutically acceptable acid addition salt thereof,

the improvement which comprises accelerating the onset of antidepressant action of said antidepressant by concurrently administering to said patient an α-adrenergic receptor blocking agent, said blocking agent being yohimbine, piperoxan, prazosin, phentolamine, metiamide, phenoxybenzamine, thymoxamine, dibozane, clozapine, or mianserin, or a pharmaceutically acceptable acid addition salt thereof; wherein said blocking agent is administered in an amount effective to achieve the onset of said antidepressant activity within from 1 to 7 days.

4,310,525
METHOD OF TREATMENT OF INFLAMMATION

Eric L. Nelson, Santa Ana, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.

Filed Jan. 23, 1981, Ser. No. 227,628
Int. Cl.³ A61K *31/33*
U.S. Cl. 424—244 13 Claims

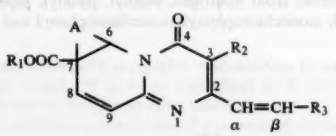
1. A method of treating inflammation in humans and animals comprising contacting the inflamed area of said humans and animals with an effective, anti-inflammatory amount of 1-dodecylazacycloheptan-2-one as the sole active anti-inflammatory agent.

4,310,526
SUBSTITUTED 6,7-METHYLENE PYRIDO[1,2-A]PYRIMIDINES USEFUL AS ANTI-ALLERGIC AND ANTI-ULCER AGENTS

Gianfederico Doria, Milan; Ciriaco Romeo, Serino; Piero Sberze, Varese; Marcellino Tibolla, Canale d'Agordo, and Maria L. Corno, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Apr. 10, 1980, Ser. No. 138,879
Claims priority, application United Kingdom, May 8, 1979, 15810/79
Int. Cl.³ A61K *31/505;* C07D *471/04*
U.S. Cl. 424—248.55 19 Claims

1. Compounds having the following general formula

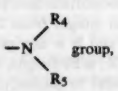


(I)

wherein

A represents a —CH_2— group, thereby providing a cyclopropane ring fused to the pyrido ring at the 6,7-position;

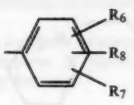
R_1 represents a hydrogen atom or a C_1–C_{12} alkyl group which is unsubstituted or substituted by a



wherein each of R_4 and R_5 independently represents a hydrogen atom or a C_1–C_{10} alkyl group, or R_4 and R_5, taken together with the nitrogen atom to which they are attached, form a N-pyrrolidinyl, piperidino or morpholino group;

R_2 represents a hydrogen atom or a C_1–C_6 alkyl group or a C_3- or C_4-alkenyl group;

R_3 represents (a) a furyl, thienyl or pyridyl group each of which is unsubstituted or substituted by a methyl group; or (b) a group of formula



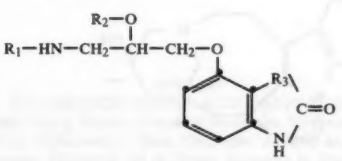
wherein each of R_6, R_7 and R_8 independently represents a hydrogen or halogen atom, a hydroxy group, a C_1–C_4 dialkylamino group, a group —CF_3 or a group —R_9 or —OR_9, where R_9 represents a C_1–C_6 alkyl or C_3- or C_4-alkenyl group and pharmaceutically acceptable salts thereof.

4,310,527
ETHERIFIED HYDROXY QUINAZOLONE COMPOUNDS

Knut A. Jaeggi, Basel; Franz Ostermayer, Riehen, and Herbert Schröter, Füllinsdorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 751,233, Dec. 16, 1976, Pat. No. 4,140,789. This application Mar. 8, 1979, Ser. No. 18,397
Claims priority, application Switzerland, Jan. 8, 1976, 161/76
Int. Cl.³ A61K *31/505;* C07D *239/80*
U.S. Cl. 424—251 9 Claims

1. A compound of the formula



(I)

in which R_1 denotes optionally substituted lower alkyl which is optionally branched at the linking carbon atom, R_2 represents hydrogen or lower alkanoyl and R_3 is a group of the formula —CO—NH— or of the formula —CH_2—NH— in the form of a racemate, optical antipode or an acid addition salt thereof which can be used pharmaceutically.

8. A pharmaceutical composition useful in the treatment of disorders in the cardiac rhythm and coronary heart diseases as well as of hypertension comprising a therapeutically effective amount of a compound as claimed in claim 1, or an acid addition salt thereof which can be used pharmaceutically, together with a pharmaceutical excipient.

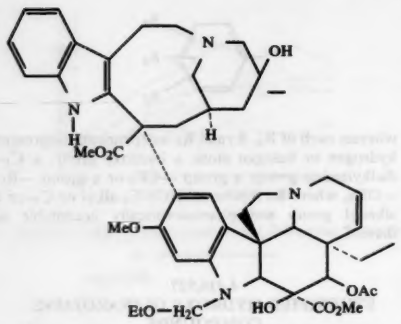
4,310,528
PROCESS FOR THE PREPARATION OF BIS-INDOLE ALKALOIDS AND ACID-ADDITION SALTS THEREOF AND METHODS OF TREATING TUMORS WITH BIS-INDOLE ALKALOIDS

Karola Jovanovics, and Sandor Görög, both of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 61,353, Jul. 27, 1979. This application Apr. 8, 1980, Ser. No. 138,340
Claims priority, application Hungary, Apr. 23, 1979, RI 708
Int. Cl.³ A61K *31/475;* C07D *519/04*
U.S. Cl. 424—262 7 Claims

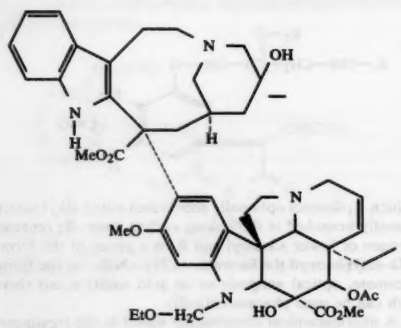
1. A method of treating leukemia, carcinoma, or lymphoma

in an animal which comprises the step of administering to said animal a pharmaceutically effective amount of the formula (Ia)



or a pharmaceutically acceptable acid addition salt thereof.

2. A process for the preparation of a compound of the formula (Ia)



or a pharmaceutically acceptable acid addition salt thereof, which comprises the steps of:

(a) oxidizing vinblastine or a pharmaceutically acceptable acid addition salt thereof with chromic acid or an alkali metal dichromate at a temperature of −90° C. to −45° C. in the presence of a water-immiscible organic solvent in which alkaloids are readily soluble, acetic anhydride, glacial acetic acid, and ethanol in an amount up to 10% by volume of the water-immiscible organic solvent;

(b) adjusting the pH of the oxidation reaction of step (a) to a range of 8 to 10 by adding an aqueous alkaline solution thereby forming an organic phase containing alkaloids and an aqueous phase at a temperature no higher than 50° C.;

(c) separating the aqueous phase from the organic phase to leave an alkaloid mixture and driving the water-immiscible organic solvent therefrom; and

(d) separating the desired product from the alkaloid mixture leaving behind a residue containing vincristine and N-desmethyl-vinblastine.

4,310,529

INTERMEDIATES TO 1,9-DIHYDROXYOCTAHYDROPHENANTHRENES

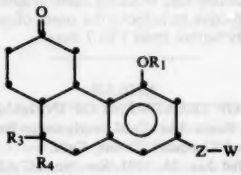
Thomas H. Althuis, Groton; Charles A. Harbert, Waterford; Michael R. Johnson, Gales Ferry, and Lawrence S. Melvin, Jr., Ledyard, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 78,476, Sep. 24, 1979, Pat. No. 4,268,523, which is a division of Ser. No. 851,503, Nov. 14, 1977, Pat. No. 4,188,495. This application Dec. 22, 1980, Ser. No. 218,712

Int. Cl.³ A61K *31/44, 31/445;* **C07D** *213/50, 213/55*

U.S. Cl. 424—263 **10 Claims**

1. A compound selected from the group consisting of those having the formula



wherein

R_1 is hydrogen, benzyl, benzoyl, alkanoyl of 1 to 5 carbon atoms or $—CO—(CH_2)_p—NR'R''$ wherein p is 0 or an integer from 1 to 4; each of R′ and R″ when taken individually is hydrogen or alkyl of 1 to 4 carbon atoms; R′ and R″ when taken together with the nitrogen to which they are attached form a 5- or 6-membered heterocyclic ring selected from piperidino, pyrrolo, pyrrolidino, morpholino and N-alkylpiperazino having from 1 to 4 carbon atoms in the alkyl group;

R_3 is selected from hydrogen, methyl and ethyl;

R_4 is selected from hydrogen, alkyl of 1 to 6 carbon atoms and benzyl;

Z is selected from:

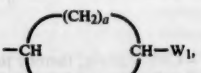
(a) alkylene having from one to nine carbon atoms;

(b) $—(alk_1)_m—X—(alk_2)_n—$ wherein each of (alk_1) and (alk_2) is alkylene having from 1 to 9 carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than 9;

m and n are each 0 or 1;

X is selected from O, S, SO and SO_2; and

W is selected from hydrogen, methyl, pyridyl, piperidyl, phenyl, monochlorophenyl, monofluorophenyl and



wherein W_1 is selected from hydrogen, phenyl, monochlorophenyl and monofluoropenyl; a is an integer from 1 to 5 and b is 0 or an integer from 1 to 4, with the proviso that the sum of a and b is not greater than 5; with the proviso that when R_1 is hydrogen, benzyl, benzoyl or said alkanoyl, W is pyridyl or piperidyl.

10. A process for producing analgesia in a mammal which comprises administering to the mammal an analgesia-producing quantity of a compound of claim 1.

4,310,530

N-BENZOYL N-PYRIDYLOXY PHENYL UREA

Ryuzo Nishiyama, Takatsuki; Takahiro Haga, Kusatsu; Tadaaki Toki; Tohru Koyanagi, both of Moriyama, and Shigeo Murai, Yookaichi, all of Japan, assignors to Ishihara Sangyo Kaisha Ltd., Osaka, Japan

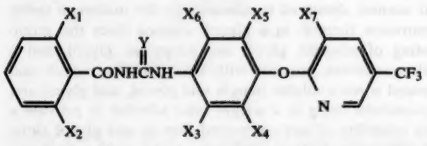
Filed Sep. 3, 1980, Ser. No. 183,650

Claims priority, application Japan, Sep. 7, 1979, 54-114862; Feb. 8, 1980, 55-14430

Int. Cl.[3] C07D *213/64;* A01N *43/40*

U.S. Cl. 424—263 9 Claims

1. N-benzoyl N'-pyridyloxy phenyl ureas having the formula



(I)

wherein X_1 represents a hydrogen or halogen atom or methyl, trifluoromethyl or nitro group; X_2 represents a hydrogen or halogen atom; X_3, X_4, X_5 and X_6 respectively represent a hydrogen or halogen atom or a C_1–C_4 alkyl group, a C_1–C_4 alkoxy group, a C_1–C_4 alkylcarbonyl group, a C_1–C_4 alkoxycarbonyl group or nitro group; when X_3 and X_6 are both hydrogen atoms, at least one of X_4 and X_5 is a C_1–C_4 alkyl group, a C_1–C_4 alkoxy group, a C_1–C_4 alkylcarbonyl group, or a C_1–C_4 alkoxycarbonyl group; and X_7 represents a hydrogen or halogen atom; and Y represents oxygen or sulfur atom.

4,310,531

5-(PYRIDINYL)-BENZOXAZOL-2(3H)-ONES AND THEIR USE AS CARDIOTONICS

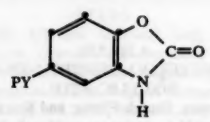
George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Nov. 24, 1980, Ser. No. 209,416

Int. Cl.[3] A61K *31/44;* C07D *413/04*

U.S. Cl. 424—263 7 Claims

1. 5-PY-benzoxaxol-2(3H)-one having the formula



or pharmaceutically-acceptable acid-addition or cationic salt thereof, where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4. A cardiotonic composition for increasing cardiac contractility which comprises a pharmaceutically-acceptable inert carrier and, as the active component thereof, a cardiotonically-effective amount of 5-PY-benzoxazol-2(3H)-one or pharmaceutically-acceptable acid-addition or cationic salt thereof, where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

6. The method for increasing cardiac contractility in a patient requiring such treatment which comprises administering orally or parenterally in a solid or liquid dosage form to such patient a cardiotonically-effective amount of 5-PY-benzoxazol-2(3H)-one or pharmaceutically-acceptable acid-addition or cationic salt thereof, where PY is 4- or 3-acid-addition or cationic salt thereof, where PY is 4- or 3-pyridinyl or 4- or 3-pyridinyl having one or two lower-alkyl substituents.

4,310,532

METHODS AND PIPERIDINYL-ALKYL-BENZAMIDE COMPOSITION FOR INHIBITING H_2 HISTAMINE RECEPTORS

William D. Roll, Toledo, Ohio, assignor to The University of Toledo, Toledo, Ohio

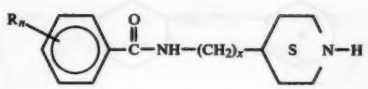
Filed Mar. 24, 1980, Ser. No. 133,453

Int. Cl.[3] A61K *31/445*

U.S. Cl. 424—267 11 Claims

1. The method of inhibiting H_2 histamine receptors comprising the steps of:

(A) preparing a unit dosage of an amount sufficient to inhibit H_2 histamine receptors of piperidinyl-alkyl-benzamide having the general formula:



wherein R is hydrogen, an alkyl group having from 1 to 4 carbon atoms, an alkoxy group having from 1 to 4 carbon atoms, halo, amino, hydroxy, or where R is meta trifluoromethyl, n is 1, 2, or 3 when R is methoxy, but is otherwise 1, and x is 1, 2, or 3 with the proviso that when n is 1, R in the meta position is trifluoromethyl or hydrogen and physiologically acceptable salts thereof;

(B) administering an amount sufficient to inhibit H_2 histamine receptors of said piperidinyl-alkyl-benzamide to an animal requiring inhibition of said H_2 histamine receptors.

4,310,533

GUANIDINOBENZOIC ACID DERIVATIVES

Yoshiaki Uegai, Ibaraki; Tsuyoshi Watanabe, Kadoma; Masashi Shiota, Nishinomiya; Itsuo Okumoto, Ashiya, and Naohiro Kayama, Takatsuki, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

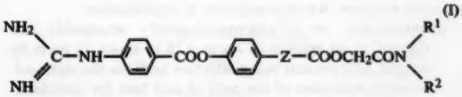
Filed Aug. 29, 1980, Ser. No. 182,513

Claims priority, application Japan, Aug. 31, 1979, 54/110470

Int. Cl.[3] A61K *31/445;* C07C *101/68*

U.S. Cl. 424—267 9 Claims

1. A guanidinobenzoic acid derivative of the general formula:



(I)

wherein Z represents a carbon-carbon covalent bond, or a methylene, ethylene or vinylene group, R^1 represents a hydrogen atom, or a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms, R^2 represents a cycloalkyl or cycloalkenyl group containing from 3 to 8 carbon atoms, or a phenyl or benzyl group, or NR^1R^2 represents a heterocyclic ring selected from the group consisting of 1-pyrrolidinyl, piperidino, 1-pyrrolyl, morpholino, thiamorpholino and aza-2,5-cyclohexadienyl rings, or an acid addition salt thereof.

9. A method of inhibiting the activity of plasmin and/or trypsin which comprises administering a therapeutically effective amount of at least one guanidinobenzoic acid derivative as claimed in claim 1, or an acid addition salt thereof.

4,310,534

PHARMACEUTICALLY ACTIVE 2-(4-AMINOBUTOXY)STILBENES

Ryoji Kikumoto, Machida; Akihiro Tobe, Kawasaki; Harukazu Fukami, Yokohama; Mitsuo Egawa, Yokohama, and Kunihiro Ninomiya, Machida, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

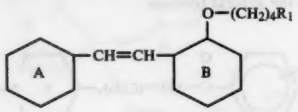
Filed Jul. 30, 1980, Ser. No. 173,476

Claims priority, application Japan, Aug. 16, 1979, 54/104218

Int. Cl.[3] A61Y *31/445*

U.S. Cl. 424—267 2 Claims

1. A compound having the formula (I):



wherein R_1 is hydroxypiperidino and wherein at least one of the benzene rings of said compounds is substituted with at least one substituent selected from the group consisting of halogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, —NR^5R^6 wherein R^5 and R^6 are each C_1–C_3 alkyl, nitro and

wherein R^7 is C_1–C_3 alkyl, and an acid addition salt thereof.

2. A therapeutic composition, comprising:

a therapeutically effective amount of the compound of claim 1 and a pharmaceutically acceptable carrier.

4,310,535

COMBINATION OF DRUGS AND A METHOD FOR THE SELECTIVE CONTROL OF THE IMMUNE REACTIONS EVOKED IN A HOST BY THE ADMINISTRATION OF ANTIGENS

Walter Pierpaoli, Bachtestrasse 23, Ebmatingen, Switzerland (CH-8123)

Filed Nov. 29, 1977, Ser. No. 855,546

Claims priority, application United Kingdom, Nov. 30, 1976, 49826/76; Jun. 27, 1977, 26817/77

Int. Cl.[3] A61K *31/40, 31/415, 31/445*

U.S. Cl. 424—273 R 9 Claims

1. A drug composition effective to selectively control the immune reactions evoked in a host by the administration of selected antigens, which comprises, in combination;

phentolamine, or a pharmacologically acceptable salt thereof, in an amount of about 0.25 to about 15 parts by weight, said amount being effective to block the alpha-adrenergic receptors of the cells of said host for catecholamines;

haloperidol, or a pharmacologically acceptable salt thereof, in an amount of about 0.25 to about 15 parts by weight, said amount being effective to block the dopaminergic receptors of the cells of said host;

a compound selected from the group consisting of serotonin, a precursor thereof, and a pharmacologically acceptable salt thereof, in an amount of about 5 to about 150 parts by weight, said amount being effective to increase the level of serotonin in said host and optionally,

as a fourth component, dopamine, or a pharmacologically acceptable salt thereof, in an amount of about 0.5 to 50 parts by weight, said amount being effective to decrease the release of growth hormone in said host.

4,310,536

RODENTICIDAL COMPOSITIONS

Eugene Boschetti, Venissieux, and Jean-Claude Lechevin, Lyons, both of France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyons, France

Continuation-in-part of Ser. No. 713,283, Aug. 10, 1976, abandoned. This application Dec. 14, 1977, Ser. No. 860,468

Claims priority, application France, Aug. 19, 1975, 75 25639; Jul. 13, 1976, 76 21377

Int. Cl.[3] A01N *43/16, 35/00*

U.S. Cl. 424—281 5 Claims

1. A composition having rodenticidal activity comprising a compound selected from the group consisting of chlorophacinone, diphacinone, bromadiolone, and coumachlor, in a rodenticidal amount, dissolved at substantially the maximum stable concentration thereof, in a glycol selected from the group consisting of ethylene glycol and propylene glycol, and a volatile co-solvent, miscible with said glycol, in which said compound is more soluble than in said glycol, said glycol and said co-solvent being in a weight ratio selected to provide a greater solubility of said compound than in said glycol alone under otherwise identical conditions, said weight ratio being within the range of about 2.5–5.5.

4,310,537

ACETYL- AND CARBALKOXYTHIOUREIDOBENZOPHENONES

Edward E. Kilbourn, Chalfont, and W. David Weir, Levitown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 694,746, Jun. 10, 1976, Pat. No. 4,060,636. This application Oct. 7, 1977, Ser. No. 840,452

Int. Cl.[3] A01N *47/10, 47/28;* A61K *31/17, 31/27*

U.S. Cl. 424—300 8 Claims

1. A composition useful as an anthelmintic or antifungal agent which comprises an effective amount of 3-(3-carbomethoxythioureido)-4-(3-acetylthioureido)benzophenone.

4,310,538

3-HALO-1-AZABICYCLO[3.2.0]HEPT-2-EN-7-ONE-2-CARBOXYLIC ACID

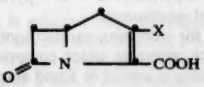
Burton G. Christensen, Scotch Plains, and Ronald W. Ratcliffe, Matawan, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 26,979, Apr. 4, 1979, abandoned, which is a continuation of Ser. No. 843,374, Oct. 19, 1974, abandoned. This application May 23, 1980, Ser. No. 152,913

Int. Cl.[3] C07D *487/04;* A61K *31/40;* C07D *705/08*

U.S. Cl. 424—274 2 Claims

1. A compound having the structure:



wherein X is chloro or bromo.

2. An antibacterial pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,310,539

BIOCIDAL ISOTHIOUREA COMPOUNDS

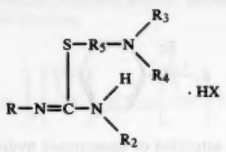
Llewellyn W. Fancher, and Don R. Baker, both of Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 22,755, Mar. 22, 1979, Pat. No. 4,233,318, which is a continuation of Ser. No. 815,975, Jul. 15, 1977. This application Feb. 25, 1980, Ser. No. 124,488

Int. Cl.[3] C07D *127/26;* A01N *47/42*

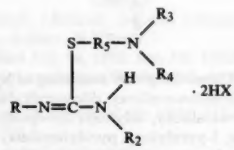
U.S. Cl. 424—326 10 Claims

1. A compound having the general structural formula



wherein X is Cl or Br; R is a straight or branched chain alkyl radical containing 7 to 12 carbon atoms; R_2 is $—C_7H_{15}$ R_3 and R_4 are independently alkyl containing 1 to 2 carbon atoms; and R_5 is divalent alkylene containing 2 to 3 carbon atoms.

6. A method of controlling a microorganism selected from bacteria and fungi which comprises applying to the locus where such control is desired an effective amount of a compound having the general structural formula



wherein X is Cl or Br; R is a straight or branched chain alkyl radical containing 7 to 12 carbon atoms; R_2 is $—C_7H_{15}$; R_3 and R_4 are independently alkyl containing 1 to 2 carbon atoms; and R_5 is divalent alkylene containing 2 to 3 carbon atoms.

4,310,540

COMBATING ARTHROPODS WITH NOVEL BENZYL ESTERS

Reinhard Lantzsch; Albrecht Marhold, both of Leverkusen; Wolfgang Behrenz, Overath, and Ingeborg Hammann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

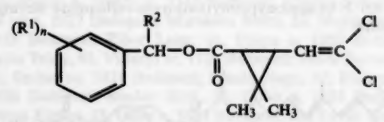
Filed Apr. 16, 1979, Ser. No. 30,579

Claims priority, application Fed. Rep. of Germany, May 5, 1978, 2819788

Int. Cl.[3] A01N *43/16;* C07D *317/44;* A01N *37/00;* C07C *69/74*

U.S. Cl. 424—282 10 Claims

1. A benzyl ester of the formula



in which

n is 1, 2, 3, 4 or 5,

R^1 each independently is hydrogen, halogen, halogenoalkoxy, $—OCF_2O—$, $—OCF_2CH_2O—$ or $—OCF_2CHFO—$ and at least one R^1 is halogenoalkoxy, $—OCF_2O—$, $—OCF_2CH_2O—$ or $—OCF_2CHFO$, and

R^2 is hydrogen, C_{1-4}-alkyl, cyano or ethynyl.

4,310,541

METHOD OF TREATING GIARDIASIS AND TRICHOMONIASIS

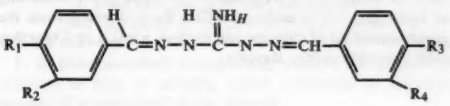
Ching C. Wang, Watchung, and Nancy J. Dick, Colts Neck, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 22, 1980, Ser. No. 189,415

Int. Cl.[3] A61K *31/275*

U.S. Cl. 424—304 3 Claims

1. A method of treating giardiasis and trichomoniasis in humans which comprises the administration to a patient in need of such therapy an amount effective for the treatment of giardiasis and trichomoniasis of a benzylideneaminoguanidine of structural formula:



or a pharmaceutically acceptable salt thereof, wherein:

R_1 and R_3 are independently

(a) halogen

(b) trifluoromethyl or

(c) cyano; and

R_2 and R_4 are independently

(a) hydrogen or

(b) halogen.

4,310,542

NOVEL CYCLOPROPANE CARBOXYLIC ACID ESTERS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

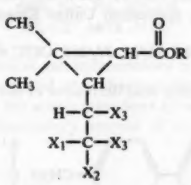
Continuation of Ser. No. 41,702, May 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 834,659, Sep. 19, 1977, abandoned, and Ser. No. 5,375, Jan. 22, 1979, abandoned. This application Mar. 30, 1981, Ser. No. 249,195

Claims priority, application France, Sep. 21, 1976, 76 28279; Jul. 19, 1977, 77 22078; Mar. 17, 1978, 78 07780

Int. Cl.[3] A01N *37/34, 43/16, 43/36, 65/00*

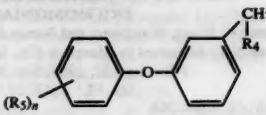
U.S. Cl. 424—304 36 Claims

1. An insecticidal, acaricidal, nematocidal or fungicidal composition comprising an insecticidally, acaricidally, nematocidally or fungicidally effective amount of a compound of the formula



wherein X_1 is selected from the group consisting of hydrogen, fluorine, chlorine and bromine, X_2 is selected from the group consisting of fluorine, chlorine and bromine, X_3 is selected from the group consisting of chlorine, bromine and iodine and R is selected from the group consisting of

-continued



and benzyl optionally substituted with at least one member of the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkenyloxy of 2 to 6 carbon atoms, alkadienyl of 4 to 8 carbon atoms, methylenedioxy, benzyl and halogens, R_3 is an aliphatic of 2 to 6 carbon atoms having at least one double bond, R_4 is selected from the group consisting of hydrogen, —CN and —C≡CH, R_5 is selected from the group consisting of chlorine and methyl, n is 0, 1 or 2 together with a suitable carrier therefor.

4,310,543

PROSTAGLANDIN COMPOSITIONS

Hugo E. Gallo-Torres, Livingston, and Navnit H. Shah, Clifton, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 9, 1980, Ser. No. 195,575
Int. Cl.[3] A61K *31/215, 31/19*
U.S. Cl. 424—305 24 Claims

1. An orally administrable pharmaceutical composition comprising a soft gelatin capsule containing a mixture comprising a solvent selected from the group consisting of polyoxyethylene sorbitan esters of fatty acids, polyethylene glycols and combinations thereof; and as an active ingredient a therapeutically effective amount of a prostaglandin; and as a stabilizer a chemically effective amount of ascorbyl palmitate.

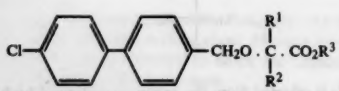
4,310,544

HYDROXYACETIC ACID DERIVATIVES WITH ANTI-ARTHRITIC PROPERTIES

Michael D. Edge, Congleton, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 66,469, Aug. 13, 1979, abandoned. This application Oct. 31, 1980, Ser. No. 203,225
Claims priority, application United Kingdom, Sep. 8, 1978, 36173/78
Int. Cl.[3] A61K *31/19, 31/235;* C07C *69/76, 51/16*
U.S. Cl. 424—308 11 Claims

1. A hydroxyacetic acid derivative of the formula:



I

wherein R^1 is hydrogen or a (1–4C)alkyl radical, R^2 is a phenyl radical optionally bearing a halogeno radical, and R^3 is hydrogen or a (1–4C)alkyl radical; or when R^3 is hydrogen, a pharmaceutically acceptable base-addition salt thereof.

11. A method of producing an anti-arthritic effect in a warm-blooded animal requiring such treatment which comprises administering to said animal an effective amount of a compound of formula I or a pharmaceutically acceptable base-addition salt thereof as defined in claim 1.

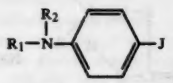
4,310,545

HYPOLIPIDEMIC AND ANTIATHEROSCLEROTIC 4-(POLYFLUOROALKYLAMINO) PHENYL COMPOUNDS

Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 884,941, Mar. 9, 1978, Pat. No. 4,205,085. This application Nov. 13, 1979, Ser. No. 93,766
Int. Cl.[3] C07C *101/60;* A61K *31/195, 31/24;* C07C *101/62*
U.S. Cl. 424—310 27 Claims

1. A compound of the formula



I

wherein R_1 is a saturated or unsaturated hydrocarbon radical of 7–19 carbon atoms which may be branched or unbranched said radical containing one or more perfluorinated (—CF_2— or —CF_3) carbon atoms excluding the carbon adjacent to the nitrogen atom; R_2 is selected from the group consisting of hydrogen or a group convertible in vivo thereinto such as methyl, carboxymethyl, acetyl, succinyl, 1-(sodiumsulfo)loweralkyl, 1-(sodiumsulfo)polyhydroxyalkyl, and 3-phenyl-1,3-bis-(sodiumsulfo)alkyl; and

J is

Z being selected from the group consisting of hydroxy, loweralkoxy, loweralkoxyloweralkoxy, diloweralkylaminoloweralkoxy, hydroxyloweralkoxy, allyloxy, 2,3-epoxypropoxy, benzyloxy, phenoxy, 3-pyridyloxy, pyridylmethoxy, carboxy loweralkoxy, carboxy hydroxyloweralkoxy, tetrahydropyranyloxy, hydroxy alkylamino, allylamino, propargylamino, 2-sulfoethylamino, carboxy loweralkylamino, carboloweralkoxy loweralkylamino, loweralkanoylamino, benzoylamino, loweralkanesulfonylamino, benzenesulfonylamino, loweralkanoylhydrazino, hydroxylamino, C_4–C_5 polymethyleneimino or a pharmaceutically acceptable non-toxic acid-addition or cationic salt thereof.

16. The method of inhibiting atherosclerotic lesion development in mammal comprising the administration of an effective lesion-development inhibiting amount of a compound of claim 1 to said mammal.

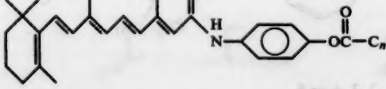
4,310,546

NOVEL RETINOIDS AND THEIR USE IN PREVENTING CARCINOGENESIS

Robert J. Gander, Whitehouse, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jul. 31, 1978, Ser. No. 929,093
Int. Cl.[3] A61K *31/22, 31/23;* C11C *3/00*
U.S. Cl. 424—311 17 Claims

1. An N-(4-acyloxyphenyl)-all-trans-retinamide having the structure:



wherein n is an integer from 1 through 18.

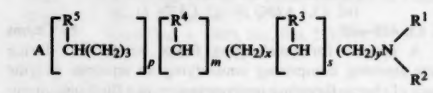
11. A method of treating carcinogenesis in epithelial tissue in a mammal in need of said treatment, which comprises periodically administering to the subject mammal an effective amount for treating carcinogenesis of a retinamide of claim 1.

4,310,547
CONTROL OF PARASITIC TICKS

LaWanda M. Hunt, Kerrville, Tex.; Malcolm J. Thompson, Baltimore, and William E. Robbins, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 26, 1980, Ser. No. 134,008
Int. Cl.³ A01N *33/02, 43/08, 43/36*
U.S. Cl. 424—325 5 Claims

1. A method of controlling parasitic ticks which attack animals comprising administering to said animals in need of treatment systemically effective amount against said ticks of a compound of the formula;



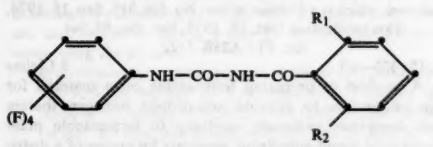
wherein A is CH_3, $CH_2{=}CH$, or $(CH_3)_2N$ and when A is $CH_2{=}CH$ or $(CH_3)_2N$, each of p, m, x and s are zero; R^1 and R^2 are individually H or alkyl from 1 to 12 carbon atoms, R^3, R^4, and R^5 are individually lower alkyl, p, m and s are individually zero or the integer 1, x is zero or the integer 3, and y is an integer from 2 to 13.

4,310,548
PESTICIDAL N-TETRAFLUOROPHENYL-N'-BENZOYL UREAS

Josef Ehrenfreund, Allschwil, Sweden, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 24, 1980, Ser. No. 114,912
Claims priority, application Sweden, Feb. 1, 1979, 79981; Oct. 22, 1979, 799453
Int. Cl.³ A01N *47/28;* C07C *127/00*
U.S. Cl. 424—322 8 Claims

1. A compound of the formula



(I)

wherein R_1 is fluorine or chlorine, and R_2 is hydrogen, fluorine or chlorine.

7. An insecticidal composition comprising (1) as active ingredient an insecticidally effective amount of a compound according to claim 1 and (2) a suitable carrier.

4,310,549
TREATMENT OF HYPERTENSION WITH 1-TERT.-BUTYLAMINO-3-(2,5-DICHLOROPHENOXY)-2-PROPANOL

Andor Hajos, 6, Himfy u., 1114 Budapest; Marton Fekete, 49, Fo utca, 1027 Budapest; Marianna Kurti, 32, Nepstadion ut, 1143 Budapest; Tibor Lang, 11, Fenyo u, 1016 Budapest; Lajos Toldy, 53, Villanyi ut, 1118 Budapest; Janos Borvendeg, 19, Szeher ut, 1021 Budapest; Laszlo Nagy, 67, Pasareti ut, 1026 Budapest; Sandor Elek, 28, Dobo u, 1153 Budapest; Istvan Elekes, 28, Delej u, 1089 Budapest, and Istvan Polgari, 1, Szabolcsu, 1134 Budapest, all of Hungary

Continuation of Ser. No. 915,290, Jun. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 773,791, Mar. 2, 1977, abandoned. This application Sep. 4, 1979, Ser. No. 72,295
Claims priority, application Hungary, Mar. 2, 1976, GO 1331
Int. Cl.³ A61K *31/135*
U.S. Cl. 424—330 1 Claim

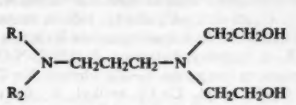
1. A method of treating hypertension arising from cardiovascular disease in humans, comprising administering to a human suffering from hypertension arising from cardiovascular disease 0.1 to 1 mg/kg body weight per day of a member selected from the group consisting of 1-tert.-butylamino-3-(2,5-dichlorophenoxy)-2-propanol and a pharmaceutically acceptable acid addition salt thereof.

4,310,550
LIPID AMINES FORMULATED WITH FAT OR LIPID EMULSIONS AS VACCINE ADJUVANTS

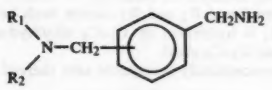
John S. Wolff, III, River Vale; George R. Hemsworth, Sparta, both of N.J., and Keith E. Jensen, Waterford, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Oct. 26, 1979, Ser. No. 88,638
Int. Cl.³ A61K *31/13, 31/685, 39/00, 47/00*
U.S. Cl. 424—365 6 Claims

1. A pharmaceutical composition, suitable for parenteral injection in man or animals, which comprises an effective amount of a compound of the formula



or



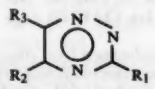
or a pharmaceutically acceptable acid addition salt thereof; wherein R_1 and R_2 are each alkyl of 12 to 20 carbon atoms; and a lipid or fat emulsion comprising about 10% vegetable oil and about 1.2% phospholipids.

4,310,551
PHARMACOLOGICALLY ACTIVE SUBSTITUTED 1,2,4-TRIAZINES

James M. Gullo, Perry; William P. Heilman, Chagrin Falls; Robert J. Wayner, Fairport Harbor, and Robert E. Moser, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

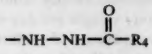
Continuation of Ser. No. 21,506, Mar. 19, 1979, Pat. No. 4,251,527, which is a division of Ser. No. 897,803, Apr. 19, 1978, Pat. No. 4,157,392, which is a continuation-in-part of Ser. No. 797,676, May 17, 1977, abandoned. This application Nov. 14, 1980, Ser. No. 206,968
Int. Cl.³ A61K *31/53*
U.S. Cl. 424—249 9 Claims

1. A pharmaceutical anti-inflammatory composition in dosage unit form comprised of a pharmaceutical carrier and an active ingredient, the active ingredient of which consists of a non-toxic anti-inflammatory amount of a compound of the formula:

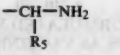


wherein

R_1 is C_1–C_4 hydroxyalkylamino, N—(C_1–C_2 alkyl)-N-(hydroxy C_1–C_4 alkyl)amino, C_1–C_{10} alkoxy, phenoxy, C_1–C_4 alkylphenoxy, C_1–C_4 alkoxyphenoxy, C_1–C_{10} alkylthio, C_3–C_6 cycloalkylthio, phenylalkylthio, hydrazino, C_1–C_4 alkylhydrazino or the group



where R_4 is C_1–C_8 alkyl, halo(C_1–C_8)alkyl or R_4 represents the group



where R_5 is C_1–C_4 alkyl;

R_2 represents hydrogen, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, phenyl, naphthyl, adamantyl, furyl, thienyl, halothienyl, benzofuryl, indolyl, pyridyl or phenyl substituted with at least one substituent selected from halo, C_1–C_6 alkyl, halo C_1–C_6 alkyl, C_1–C_6 alkoxy, acetamido, morpholino or nitro;

R_3 represents hydrogen, C_1–C_6 alkyl, phenyl, pyridyl or phenyl substituted with at least one substituent selected from C_1–C_4 alkyl, C_1–C_6 alkoxy, halo or acetamido;

provided that when R_2 is hydrogen then R_3 is also hydrogen; when R_1 is hydroxyalkylamino, N-(alkyl)-N-(hydroxyalkyl) amino, or the group X—R_6 wherein X=O, or S and R_6 is C_1–C_8 alkyl, C_7–C_8 aralkyl, C_3–C_8 cycloalkyl, C_4–C_8 cycloalkyl, alkyl, R_2 and R_3 cannot simultaneously be halo-, alkyl-, or alkoxy-substituted phenyl; when R_1 is hydrazino, methylthio, methoxy or ethoxy, R_2 is other than phenyl and R_2 and R_3 cannot both be methyl; or when R_1 is hydrazino or C_1–C_4 alkylhydrazino, R_2 is other than C_1–C_4 alkyl;

and the pharmaceutically acceptable salts thereof.

4,310,552

CASTING PERLITE BEFORE THE SWINE

Siegfried Duchstein, Oschenberg, 8580 Bayreuth, Fed. Rep. of Germany

Filed Jun. 26, 1979, Ser. No. 52,316
Claims priority, application Austria, Jun. 27, 1978, 4659/78
Int. Cl.³ A23K *1/00*
U.S. Cl. 426—2 **2 Claims**

1. A method of both improving field fertilization and the quality of the flesh of hogs raised for slaughter, comprising the steps of:

(a) admixing a digestible hog-feed meal including bran or soy meal with 10 to 50 volume percent of blown perlite of a particle size up to 5 mm and intensively blending the resulting composition;

(b) directly administering said composition ad libitum to hogs raised for slaughter thereby improving the quality of the flesh thereof and producing hog waste in the form of excrement containing excreted perlite; and

(c) fertilizing a crop-producing field with said waste.

4,310,553

PROCESS FOR PRODUCING FOOD VITAMIN CONCENTRATE FROM WINE YEAST

Ekaterina N. Odintsova, ulitsa Vavilova, 54, korpus 3, kv. 199, Moscow, U.S.S.R.

Filed Feb. 25, 1980, Ser. No. 124,287
Int. Cl.³ C12H *1/06*
U.S. Cl. 426—31 **5 Claims**

1. A process for producing a food vitamin concentrate from food yeast, which comprises subjecting to autolysis a feedstock composed of the by-product of the production of dry wines obtained after separation of new wine and comprising a residue of the starting strains of wine yeast highly-tolerant to increased concentrations of the alcohol produced thereby during fermentation and highly-tolerant to pH of the must below 3.5, said yeast having large homogeneous size cells, after separation of the remaining wine by pressing and dilution with water in a ratio of 1:1.5 to 1:3.0 based on pressed yeast; heating the thus obtained autolysate to a temperature of from 80° to 90° C.; cooling the same to a temperature of from 0° to 2° C.; separating the autolysate from the residue; and concentrating the recovered autolysate to thus obtain a food vitamin concentrate.

4,310,554

PREPARATION OF CHEESE WITH MICROENCAPSULATED ENZYMES

Norman F. Olson, Madison, Wis., and Edward L. Magee, Jr., Plano, Tex., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 10, 1979, Ser. No. 56,315
Int. Cl.³ A23C *19/02*; C12N *11/04*
U.S. Cl. 426—40 **19 Claims**

1. A process for accelerating flavor production during cheese ripening comprising emulsifying an aqueous enzyme extract of cheese flavoring microorganism in a fluid oleaginous material-emulsifying agent mixture to produce a water-in-oil emulsion wherein the aqueous extract constitutes the discontinuous phase dispersed within a continuous phase of fluid oleaginous material, dispersing the resulting emulsion in milk to form a suspension of oleaginous microcapsules containing the aqueous extract dispersed therein, coagulating the resultant milk containing suspended microcapsules to produce a cheese curd, and curing the curd to produce cheese containing flavors generated by the extract of the cheese flavoring microorganisms contained by the microcapsules.

4,310,555

METHOD AND APPARATUS FOR THE ADIABATIC EXPANSION OF LIQUID ANHYDROUS AMMONIA

William L. Kjelgaard, and Paul M. Anderson, both of State College, Pa., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 840,845, Oct. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 716,203, Aug. 20, 1976, abandoned, which is a division of Ser. No. 506,516, Sep. 16, 1974.
This application Oct. 19, 1979, Ser. No. 86,344
Int. Cl.³ A23K *1/22*
U.S. Cl. 426—69 **5 Claims**

1. A method of preparing fermentable plant material for silage production to provide non-protein nitrogen therein which comprises uniformly applying to fermentable plant material cold liquid anhydrous ammonia by means of a distribution conduit, said cold liquid anhydrous ammonia being at a temperature in the range from about −30° F. to about −17° F. and obtained by substantially adiabatically expanding a pressurized stream of liquid anhydrous ammonia until said stream reaches substantially ambient or atmospheric pressure, said pressurized stream of liquid anhydrous ammonia before being expanded being at ambient temperature, to produce said cold liquid anhydrous ammonia and then passing said cold liquid anhydrous ammonia while at substantially ambient or atmospheric pressure through said conduit and onto said plant material, said cold liquid anhydrous ammonia being applied to said fermentable plant material in an amount sufficient for silage production.

4,310,556

FOOD EMULSIFIERS

James L. Suggs, Greeneville; Dan F. Buck, Kingsport, and Howard K. Hobbs, Blountville, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 1, 1980, Ser. No. 211,977
Int. Cl.³ A21D *2/16*
U.S. Cl. 426—96 **7 Claims**

1. A dry emulsifier composition comprising

(a) about 15–40 parts by weight of succinylated monoglycerides,

(b) about 25–45 parts by weight of monoglycerides having an iodine value of about 2 to about 15,
(c) about 15–40 parts by weight of propylene glycol monoesters, and
(d) about 5–18 parts by weight of an alkali metal salt of at least one fatty acid having 8–22 carbon atoms.

4,310,557
FOOD EMULSIFIERS
James L. Suggs, Greeneville; Dan F. Buck, Kingsport, and Howard K. Hobbs, Blountville, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 1, 1980, Ser. No. 211,978
Int. Cl.[3] A21D 2/16
U.S. Cl. 426—96 8 Claims

1. A dry emulsifier composition comprising
(a) about 20–40% by weight of monoglycerides having an iodine value of about 2–15,
(b) about 40–70% by weight of propylene glycol monoesters, and
(c) about 5–20% by weight of an alkali metal salt of at least one fatty acid having 8–22 carbon atoms.

4,310,558
EXTRUDED FIBER MIXTURE PET FOOD
Lee J. Nahm, Jr., Jefferson County, Mo., assignor to Ralston Purina Company, St. Louis, Mo.
Filed Jan. 21, 1980, Ser. No. 113,912
Int. Cl.[3] C12K 1/00
U.S. Cl. 426—98 39 Claims

1. A method of producing a dry pet food comprising fibrous food pieces having a tough, pliable texture combined with a basal matrix containing proteinaceous and farinaceous materials, said pet food having a porous texture and appearance comprising the steps of;
(a) mechanically working a first mixture comprising about 35–95% by weight of a proteinaceous material, about 0–30% by weight of a farinaceous material, and sufficient water for processing, at conditions of elevated temperature above about 212° F. and elevated pressure for a time sufficient to convert the mixture into a flowable substance, said flowable substance then being extruded through a restricted orifice into an environment of lower pressure than the condition of elevated pressure, causing moisture evaporation thereby forming an expanded, fibrous food piece;
(b) forming fibrous food pieces of said first mixture by comminuting said product;
(c) blending a second mixture comprising proteinaceous and farinaceous materials with sufficient water for processing to form a matrix;
(d) combining the fibrous food pieces and matrix to form a mass said fibrous food pieces present in an amount sufficient to provide contrasting color to said matrix;
(e) mechanically working the mass at conditions of elevated temperature above about 212° F. and pressure for a time sufficient to convert the mass into a flowable substance; and
(f) extruding the flowable substance through a restricted orifice into an environment of lower pressure than the condition of elevated pressure causing expansion of the mass to form an expanded dry pet food product having a porous texture and appearance containing fibrous food pieces having a tough, pliable, fibrous texture.

4,310,559
FROZEN CONFECTIONS HAVING STABILIZED ICE GRANULES THEREIN AND PROCESS FOR MAKING SAME
Kou Mita, Tokorozawa; Satoru Rokuta, Higashi-Murayama; Kiyoshi Takada, Higashi-Yamato, and Fuziko Suzuki, Hannou, all of Japan, assignors to Snow Brand Milk Products Co., Ltd, Hokkaido, Japan
Continuation-in-part of Ser. No. 6,494, Jan. 25, 1979, abandoned. This application Mar. 11, 1980, Ser. No. 129,320
Claims priority, application Japan, Feb. 8, 1978, 53-13291
Int. Cl.[3] A23G 9/06
U.S. Cl. 426—101 8 Claims

1. In the method for making a frozen confection having scattered granules of ice wherein a soft frozen confection is admixed with granules of ice,
the improvement which comprises admixing a soft frozen confection selected from the group consisting of soft ice cream, soft iced milk, soft lactic ice and soft sherbet with uniformly coloured granules of ice, surfaces of which are refrigerated to a temperature not exceeding −30° C.,
said uniformly coloured granules of ice being prepared by freezing an edible, coloured aqueous liquid material containing at least one stabilizer to form a uniformly coloured block of ice, crushing the thus obtained uniformly coloured block of ice into pieces and then bringing the surfaces of the resultant ice pieces into contact with a refrigerant to refrigerate said resultant ice surfaces to a temperature not exceeding −30° C.

4,310,560
METHOD OF PRODUCING A POROUS, PELLETIZED FOOD PRODUCT
Robert C. Doster, Van Nuys, Calif., and Sharon L. Nelson, Spicer, Minn., assignors to Carnation Company, Los Angeles, Calif.
Continuation-in-part of Ser. No. 895,825, Apr. 13, 1978, abandoned. This application Dec. 21, 1979, Ser. No. 106,145
Int. Cl.[3] A23L 1/09, 1/30, 2/38
U.S. Cl. 426—285 15 Claims

1. A method of producing a porous, pelletized food product which comprises
forming a mixture of finely divided particulate edible materials including at least 15% by weight of a material which acquires surface stickiness when moistened, and from about 1% to 35% by weight of a chemical leavening system comprising sodium bicarbonate and a leavening acid,
spraying said mixture with an aqueous liquid while the particulate materials are tumbled and rolled to moisten the particles and form agglomerates of said materials, said agglomerates having a moisture content of about 10%–20% by weight, and
contacting said agglomerates with a stream of hot air having a temperature of between 125° F.–275° F. for 3–20 minutes to effect reaction of the components of the chemical leavening system thus releasing carbon dioxide gas and forming a porous structure within said agglomerates, and to dry said agglomerates to a moisture content of about 1%–3% by weight to produce a porous, pelletized food product.

4,310,561

PROTEIN-FREE SYNTHETIC MILK OR THE LIKE

Bruce D. Buddemeyer; William A. Neville, and Richard G. Bourne, all of Kansas City, Mo., assignors to R.G.B. Laboratories, Inc., Kansas City, Mo.

Filed Mar. 20, 1980, Ser. No. 132,188
The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.
Int. Cl.³ A23D 5/00; A23C 11/00
U.S. Cl. 426—601 18 Claims

1. A protein-free product which is a substitute for milk or cream comprising at least about 5% by weight of said substitute of a base, said base consisting essentially of:

from about 22 to 96.7% by weight of a relatively non-sweet, water soluble carbohydrate material having a D.E. of from about 10 to 70;

from about 3 to 70% by weight of fat in particle form, with a substantial portion of the fat particles having a diameter of no greater than about 3 microns; and

from about 0.3 to 16% by weight of an emulsifier for maintaining said carbohydrate and fat in a stable dispersion when the base is dispersed in an aqueous medium,

said base, when dispersed in said medium giving the base-medium dispersion a pH of from about 6.5 to 7.8,

said carbohydrate, fat and emulsifier being selected for giving a plurality of said food particles stability such that:

A. a 25% by volume thereof in water, when stored at 40° F. for 72 hours, exhibits no more than about 20% fat-water phase separation;

B. a quantity of said particles sufficient to provide a total of about 0.36 grams of fat, when dispersed in 50 mls. of black coffee at 175° F., gives a relative reflectance of at least 50%, using an Agtron Model M-500A reflectometer standardized in the red spectral mode, 640 m.u., with a 00 calibration disc for zero and a 44 calibration disc for 100% relative reflectance;

C. three grams of said food particles added to 150 mls. of 175° F. black coffee in a container having a 5 cm. diameter followed by gentle stirring and allowing the mixture to stand for two minutes, exhibits no more than about 10 oil droplets on the surface of the mixture; and

D. taking the mixture derived from test C. hereof, and allowing the same to stand for an additional 3 minutes, the mixture exhibits essentially no precipitation or flocculation, and no more than a moderate amount of feathering.

4,310,562

COATING PROCESS AND APPARATUS

Guido W. Melliger, Dover Garden Motel, Apt. 44, S. Salem St., Victory Garden, Dover, N.J. 07801

Division of Ser. No. 934,519, Aug. 17, 1978, which is a division of Ser. No. 777,468, Mar. 14, 1977, Pat. No. 4,133,290, which is a continuation-in-part of Ser. No. 672,766, Apr. 1, 1976, abandoned. This application Apr. 17, 1980, Ser. No. 140,469
Int. Cl.³ B44D 1/14
U.S. Cl. 427—3 2 Claims

1. A process for automatically coating solid pharmaceutical dosage forms which comprises, charging a plurality of tablets into a coating pan, weighing the pan and tablets and recording the weight in a pre-programmed controller means, whereby the controller means continuously monitors the weight of the tablets and accuates and executes the steps of:

(a) rotating the pan to tumble the tablets while applying by weight a series of base coatings on the tumbling tablets in the presence of drying air;

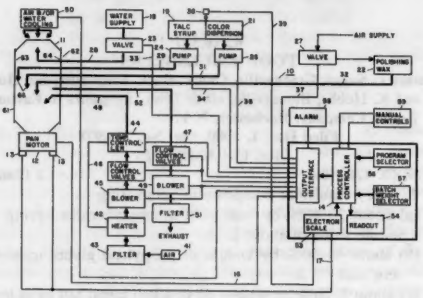
(b) rotating the pan to tumble the tablets while applying by weight a series of medium coatings, and air drying the coatings between applications;

(c) rotating the pan and coloring the tumbling tablets by applying by weight a series of applications of pigment dispersions and air-drying the color coating between applications;

(d) pre-polishing the tablets by applying a series of color dispersions in the absence of drying air and intermittently tumbling the tablets;

(e) polishing the tablets by continuously tumbling the tablets while applying a polishing material on the tablets and then removing the tablets from the coating pan,

wherein the base coating comprises the addition of about eight coatings of talc syrup upon the tablets in the presence of the drying air; and the medium coat comprises the



addition of about 32 coatings of talc syrup upon the tablets, and air drying the coated tablets between the base coating and the medium coating;

wherein each of the base coatings is applied at cycles of about 0.5 to 2 minutes per coat; each of the medium coatings is applid at cycles of about 5 to 20 minutes per coat; and

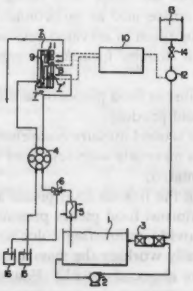
wherein prior to each coating step a fine mist of water is applied to the interior of the coating pan wall.

4,310,563

METHOD FOR AUTOMATICALLY CONTROLLING COMPOSITION OF CHEMICAL COPPER PLATING SOLUTION

Hitoshi Oka, Yokohama; Kenji Nakamura, Fujisawa; Hitoshi Yokono, Yokohama; Tokio Isogai, Fujisawa; Akira Matsuo, Yokohama; Osamu Miyazawa, and Isamu Tanaka, both of Yokosuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 15, 1980, Ser. No. 197,150
Claims priority, application Japan, Feb. 29, 1980, 55/24048
Int. Cl.³ C23C 3/02; B05D 1/18
U.S. Cl. 427—8 8 Claims



1. A method for controlling a composition of a chemical copper plating solution, which comprise leading a predetermined amount of a chemical copper plating solution sampled from a plating tank to a main electrode chamber of a pH detection cell comprising a main electrode chamber with a copper oxide electrode, a reference electrode chamber with a refer-

ence electrode and a membrane provided between both chambers, while leading a reference electrode solution to the reference electrode chamber, detecting a difference in potential between the copper oxide electrode and the reference electrode, and transmitting the difference as a signal from a pH controller when the detected potential is smaller than a present potential in the pH controller as an absolute value, thereby supplementing the chemical copper plating solution with a pH makeup solution until the detected potential exceeds the preset potential, and thereby keeping the pH of the chemical copper plating solution continuously constant.

4,310,564

METHOD FOR MODIFYING SURFACE PROPERTIES IN POLYVINYL CHLORIDE SHAPED ARTICLES

Kiyoshi Imada, Omiya; Susumu Ueno, Ibaraki; Yasuhide Nishina, Ibaraki, and Hirokazu Nomura, Ibaraki, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1980, Ser. No. 204,195

Claims priority, application Japan, Nov. 7, 1979, 54-144146

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—40 **7 Claims**

1. A method for modifying surface properties of a shaped article of a vinyl chloride-based resin which comprises the steps of

(a) exposing the surface of a shaped article of a vinyl chloride-based resin to an atmosphere of low temperature plasma of an inorganic plasma gas under a pressure not exceeding 10 Torr, and

(b) contacting the thus plasma-treated surface of the shaped article with a halogen or a hydrogen halide.

4,310,565

PROCESS OF MAKING A MAGNETIC RECORDING MEDIA

August Lehner, Roedersheim-Gronau; Heinrich Hartmann, Limburgerhof; Rudolf Bachmann, Frankenthal; Albert Kohl, Weisenheim; Herbert Spoor, Limburgerhof; Karl Mahler, Kehl, and Werner Balz, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 15, 1980, Ser. No. 150,181

Claims priority, application Fed. Rep. of Germany, May 19, 1979, 2920334

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—48 **8 Claims**

1. A process for the manufacture of magnetic recording media by dispersing a finely divided magnetic anisotropic material in a binder which contains at least 40% of an aqueous ionomeric polyurethane dispersion, applying the dispersion to a non-magnetic base, orienting the magnetic anisotropic material and drying the applied coating, wherein the aqueous ionomeric polyurethane dispersion at 50° C. forms films which have a modulus of elasticity of from 50 to 700 N/mm^2 and a DIN No. 53,157 pendulum hardness of from 20 to 110 s, the corresponding values of the modulus and hardness at room temperature being not more than 3.5 times higher.

4,310,566

BATCH METHOD FOR TERMINATING SOLID ELECTROLYTE CAPACITORS

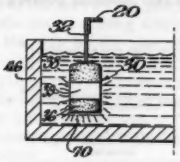
N. Christian McGrath, Strafford, N.H., assignor to Sprague Electric Company, North Adams, Mass.

Filed May 22, 1980, Ser. No. 152,445

Int. Cl.³ H01G *9/00*

U.S. Cl. 427—80 **7 Claims**

1. A batch method for terminating a plurality of solid electrolyte capacitors held in a carrier rack, said capacitors including an insulating protective coating on each capacitor body which leaves exposed the cathode and anode at opposite ends of each said body, wherein the improvement comprises applying a cured silver end-cap on the cathode end of each said body, depositing a partially cured silver coating over all of each said body including the anode end, removing said partially cured coating from between said cured cathode end-cap



and the anode end of each said body, and completing the cure of said partially cured coating on the anode end of each said body.

4,310,567

METHOD FOR CHEMICAL VAPOR DEPOSITION

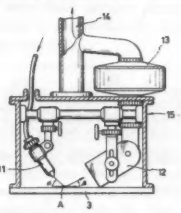
Osamu Tabata, Ikeda, and Mitoshi Waseda, Moriyama, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo and Chugoku Marine Paints, Ltd., Hiroshima, both of, Japan

Continuation-in-part of Ser. No. 928,369, Jul. 27, 1978, abandoned. This application Feb. 20, 1980, Ser. No. 123,258

Claims priority, application Japan, Aug. 2, 1977, 52-93291

Int. Cl.³ B05D *5/12, 1/00;* **C03C** *17/00;* **C23C** *13/04*

U.S. Cl. 427—82 **10 Claims**



10. A method of producing a coating on the surface of a heated base through a chemical reaction of a film forming component contained in a gas contacted with the heated base surface, and which comprises:

forming a V-shaped stream of a gas containing a film forming component by shooting the gas through a jetting means toward a heated base surface and simultaneously subjecting the shot gas to the action of a high speed sucking stream, said V-shaped stream of gas having a bottom point vertex zone, and

contacting the heated base surface with the gas at the bottom point vertex zone, thereby causing formation of a coating on the base with the film-forming component.

4,310,568

METHOD OF FABRICATING IMPROVED SCHOTTKY BARRIER CONTACTS

James K. Howard, Fishkill; William D. Rosenberg, Wappingers Falls, and James F. White, Newburgh, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 755,272, Dec. 29, 1976, Pat. No. 4,141,020. This application Nov. 15, 1978, Ser. No. 960,983

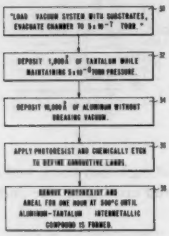
Int. Cl.³ H01L *29/48*

U.S. Cl. 427—84 **5 Claims**

1. A method of fabricating a Schottky barrier contact comprising the steps of:

forming an aluminum-tantalum layer on a monocrystalline silicon surface;

annealing the structure at a temperature above about 400° C. for about one hour whereby the tantalum is converted to a layer of an intermetallic compound of the aluminum and tantalum to form said Schottky contact; and


"LOAD VACUUM SYSTEM WITH SUBSTRATES, EVACUATE CHAMBER TO 5 x 10⁻⁷ TORR."
DEPOSIT 1,000Å OF TANTALUM WHILE MAINTAINING 5 x 10⁻⁶ TORR PRESSURE.
DEPOSIT 10,000Å OF ALUMINUM WITHOUT BREAKING VACUUM.
APPLY PHOTORESIST AND CHEMICALLY ETCH TO DEFINE CONDUCTIVE LANDS.
REMOVE PHOTORESIST AND ANNEAL FOR ONE HOUR AT 500°C UNTIL ALUMINUM-TANTALUM INTERMETALLIC COMPOUND IS FORMED.

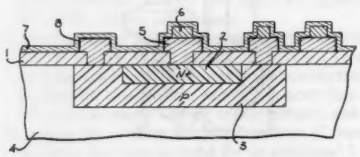
forming an electrical contact to the Schottky barrier contact.

4,310,569

METHOD OF ADHESION OF PASSIVATION LAYER TO GOLD METALIZATION REGIONS IN A SEMICONDUCTOR DEVICE

Alan L. Harrington, Glendale, Calif., assignor to TRW Inc., Los Angeles, Calif.

Filed Mar. 10, 1980, Ser. No. 128,622
Int. Cl.³ H01L *21/48, 21/283*
U.S. Cl. 427—89 **5 Claims**



1. A method for adhering a passivation layer to gold regions in a semiconductor device, comprising the steps of:
(a) providing a semiconductor device having at least one gold region formed thereon;
(b) selectively depositing a layer of a metal, which is reactive with said gold region, over said gold region, so as to form a gold-reactive metal interface;
(c) reacting said gold with said metal at said interface;
(d) removing substantially all of the unreacted portions of the metal so as to expose the reacted interface; and
(e) depositing a layer of passivation material over the reacted interface.

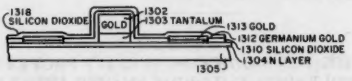
4,310,570

FIELD-EFFECT TRANSISTORS WITH MICRON AND SUBMICRON GATE LENGTHS

Joseph A. Calviello, Kings Park, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 105,663, Dec. 20, 1979, abandoned. This application May 1, 1980, Ser. No. 145,625
Int. Cl.³ H01L *21/283, 21/24*
U.S. Cl. 427—89 **1 Claim**

1. A process for fabricating the source and drain electrodes of a field-effect transistor of the type having the source and drain electrode positioned on the surface of an N-doped layer of gallium arsenide, said N-doped layer being in contact with and supported by a high resistivity substrate, comprising the steps of:
(a) depositing a layer of germanium gold on the N-layer in the area of the source and drain electrodes,
(b) depositing a layer of gold over the layer of germanium gold,
(c) depositing a layer of silicon dioxide over the layer of gold, said layer of silicon dioxide extending beyond the layer of gold on to the surface of the gallium arsenide to encapsulate the gold and germanium gold layers,



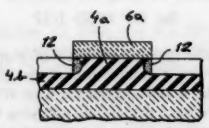
(d) heating the device in the area of the electrodes to sinter-alloy the germanium gold and gold layers to said N-layer, and
(e) removing said silicon dioxide layer to expose the source and drain electrodes formed by the sinter-alloyed layers of gold and germanium gold.

4,310,571

PROCESS FOR PRODUCING A CALIBRATED RESISTANCE ELEMENT

Vincenzo Daniele, Milan; Giuseppe Corda, Saronno; Andrea Ravaglia, Bologna, and Giuseppe Feria, Milan, all of Italy, assignors to SGS ATES, Componenti Elettronici S.p.A., Agrate Brianza, Italy

Filed Apr. 27, 1979, Ser. No. 34,204
Claims priority, application Italy, Apr. 28, 1978, 22788 A/78
Int. Cl.³ H01C *17/06*
U.S. Cl. 427—102 **10 Claims**



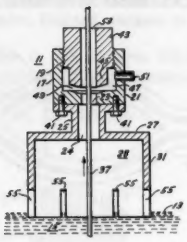
1. A process for producing a calibrated resistance element on a substrate, comprising the steps of:
(a) depositing a dielectric layer attackable by a chemical agent on said substrate;
(b) topping said dielectric layer with a coating of a different material resistant to attack by said agent;
(c) destroying part of said coating to leave a residue with at least one exposed lateral edge;
(d) subjecting said dielectric layer to an isotropic attack by said agent with resulting reduction in the thickness of said layer except for a pedestal supporting said residue and with erosion of the periphery of said pedestal underneath said exposed edge whereby an elongate undercut is formed in said periphery;
(e) forming a conductive deposit of predetermined resistivity on said dielectric layer at least to the level of said residue with penetration of said undercut by a filiform portion of said deposit; and
(f) removing said deposit at least along said edge while leaving intact the filiform portion thereof accumulated in said undercut.

4,310,572

METHOD FOR WIPING HOT DIP METALLIC COATINGS

Anthony J. Stavros, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Apr. 11, 1980, Ser. No. 139,607
Int. Cl.³ C23C 1/02, 1/08
U.S. Cl. 427—349 27 Claims



1. A method of prevent defects on hot dipped linear material coated with a multiphase coating in a molten aluminum-zinc coating bath comprised of from 25 to 70% aluminum the balance substantially zinc wherein the temperature of the molten coating bath is at least about 583° C. and the vapor pressure of the zinc is greater than the vapor pressure of zinc in galvanizing coating baths comprising:

(a) passing the linear material from the aluminum-zinc coating bath into a closely confining containment means containing a non-oxidizing protective atmosphere composed of a gas or gases selected from the group consisting of (a) neutral gases and (b) effectively reducing gases,

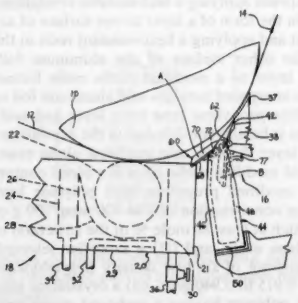
(b) preventing accumulation of particulates of metallic zinc upon the surface of the coating bath adjacent to the exit point of the linear material from the bath and upon the coated surface of the linear material.

4,310,573

METHOD AND APPARATUS FOR SUPPLYING COATING TO A COATER

Wayne A. Damrau, Wisconsin Rapids, Wis., assignor to Consolidated Papers, Inc., Wisconsin Rapids, Wis.

Filed Jul. 31, 1980, Ser. No. 174,248
Int. Cl.³ B05C 11/02, 1/00; B05D 3/12, 1/28
U.S. Cl. 427—356 17 Claims



14. A method of operating a pair of coaters, one of which has a doctor blade thereon, and both of which are located on a single backing roll, for applying coating to a web of paper being run on the backing roll, comprising the steps of:

a. supplying an excess of coating to one of the coaters;

b. applying at least a portion of the coating to the web with the one coater;

c. collecting the excess coating which was supplied to but not applied to the web by the one coater;

d. collecting the excess coating which was supplied to and applied to the web by the one coater with the doctor blade;

e. transferring by gravity the collected coating from the one coater to the other coater to at least partially supply the other coater with coating; and

f. applying at least a portion of the coating to the web with the other coater.

4,310,574

METHOD OF PROTECTING A SURFACE WITH A SILICON-SLURRY/ALUMINIDE COATING

Daniel L. Deadmore, Middleburg Heights, and Stanley G. Young, North Olmsted, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 20, 1980, Ser. No. 161,254
Int. Cl.³ B05D 7/26
U.S. Cl. 427—405 7 Claims

1. A method of protecting the surface of a substrate of a metallic base system selected from the group consisting of nickel-base and cobalt-base superalloys, composites and directional eutectics comprising the steps of:

covering said surface with a layer of substantially pure silicon, and

aluminizing the outermost surface portion of said layer by pack cementation in argon thereby forming an outer aluminide coating thereon.

4,310,575

METHOD OF INCREASING THE CORROSION RESISTANCE OF ENAMEL COATED STEEL

Ali Khayat, Carlsbad, and Klaus P. Redenz, Poway, both of Calif., assignors to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 141,077, Apr. 17, 1980, abandoned. This application Feb. 25, 1981, Ser. No. 238,386
Int. Cl.³ B05D 1/38, 3/02
U.S. Cl. 427—409 8 Claims

1. A method of increasing the corrosion resistance of enamel coated steel comprising:

coating the surface of the enamel coated steel with an effective amount of a silyation agent, and

bonding said silyation agent to said enamel coated steel to prevent the corrosion of said enamel coated steel.

5. A method of preventing the interaction of a canned food product with its container comprising applying a first coating of enamel to the inside of the container, drying the enamel, coating the surface of said enamel with an effective amount of a silyation agent, and bonding said silyation agent to said enamel coated container to prevent the corrosion of said container.

4,310,576

ADHESIVE-APPLYING APPARATUS AND METHOD

Karlheinz Hesselmann, Au bei Bad Aibling; Bernhard Tschiers, and Ludwig Ertl, both of Rosenheim, all of Fed. Rep. of Germany, assignors to Planatolwerk W. Hesselmann, Chemische und Maschinenfabrik für Klebetechnik, Thansau, Fed. Rep. of Germany

Filed Jun. 4, 1980, Ser. No. 156,406
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1979, 2922978
Int. Cl.³ B05D 1/28; B05C 1/08
U.S. Cl. 427—428 9 Claims

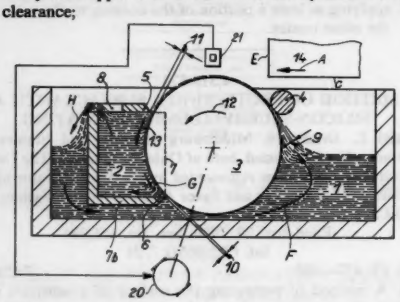
8. A method of coating an edge of a stack of sheets with a flowable adhesive substance, comprising the steps of:

(a) moving said stack continuously along a transport path

above a bath of said substance with said edge forming a horizontal lower boundary of the stack;

(b) partly immersing an applicator roller in said bath with the top of the roller lying just below the level of said lower boundary;

(c) enclosing the downstream side of said roller, as seen in the direction of stack motion, by a container which rises above the bath surface and has upper and lower edges respectively spaced from the roller periphery by a relatively wide upper clearance and a relatively narrow lower clearance;



(d) rotating said roller codirectionally with the approaching stack up to an instant when the front of the stack lies substantially above the top of the roller, thereby accumulating a quantity of said substance on the downstream side of the roller to fill said container by way of its upper clearance; and

(e) reversing at said instant the rotation of said roller whereby the accumulated substance from said container adheres to said roller and substantially uniformly coats the lower boundary of the stack moving across said roller.

4,310,577

LIQUID CRYSTAL FILM LAMINATE

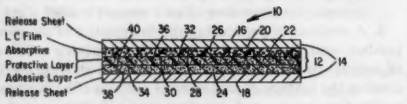
Thomas W. Davison, Algonquin, and Fred K. Suzuki, Arlington Heights, both of Ill., assignors to Liquid Crystal Products, Inc., Arlington Heights, Ill.

Filed Aug. 24, 1979, Ser. No. 69,386

The portion of the term of this patent subsequent to Jul. 17, 1996, has been disclaimed.

Int. Cl.³ B44F *1/00*

U.S. Cl. 428—1 **16 Claims**



1. A liquid crystal film laminate which comprises an indicator component and a supportive and protective component removable therefrom, said indicator component including a discrete flexible liquid crystal film having an outer surface which forms one of two opposite side surfaces on the component, said film comprising a film-forming polymer matrix having a cholesteric liquid crystalline phase material dispersed therein for providing a visible response to the application of energy, said supportive and protective component including two release surfaces provided by at least one release sheet, said release surfaces separably contacting respective ones of said indicator component side surfaces in covering relation thereto for removably supporting and protecting the indicator component, said outer surface of the film thereby being exposed directly to the atmosphere to provide an unobstructed view of the surface upon removal of said supportive and protective component.

4,310,578

RETORT-STERILIZABLE LAMINATED STRUCTURE AND PROCESS FOR PREPARATION THEREOF

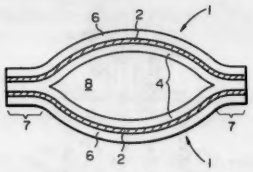
Tadahiko Katsura; Kenji Suzuki, both of Yokohama, and Senji Ito, Ayase, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Jul. 5, 1979, Ser. No. 55,004

Claims priority, application Japan, Jul. 5, 1978, 53-80870; Sep. 11, 1978, 53-110647; Oct. 26, 1978, 53-131022

Int. Cl.³ B65D *00/00*; B32B *15/08*

U.S. Cl. 428—35 **10 Claims**



1. A retort-sterilizable laminated structure comprising an aluminum foil or sheet, a heat-sealable crystalline propylene type resin layer formed on one surface of the aluminum foil or sheet and a heat-resistant resin layer formed on the other surface of the aluminum foil or sheet, wherein said aluminum foil or sheet is heat-fusion-bonded to said crystalline propylene type resin layer through a layer of a modified olefin resin, and wherein said modified olefin resin is a blend comprising (A) a crystalline modified propylene type polymer having a carbonyl group concentration of 1 to 600 meq/100 g of the polymer, in which at least 80 mole % of the structural olefin units are propylene units, and (B) a modifier selected from the group consisting of (i) low density polyethylene having a density of 0.915 to 0.940 g/cc, (ii) a crystalline modified ethylene type polymer having a carbonyl group concentration of 1 to 600 meq/100 g of the polymer, in which at least 80 mole % of the structural olefin units are ethylene units, and (iii) a combination of at least one member selected from said low density polyethylene (i) and said crystalline modified ethylene type polymer (ii) with at least one member selected from an ethylene-propylene copolymer rubber in which 20 to 80 mole % of the structural units are propylene units and a modified ethylene-propylene copolymer rubber having a carbonyl group concentration of 1 to 600 meq/100 g of the polymer, the amount of said modifier (B) having 3 to 30 parts by weight per 100 parts by weight of said crystalline modified propylene type polymer (A).

9. A process for the preparation of laminated structures, which comprises applying a heat-sealable crystalline propylene type resin in the form of a layer to one surface of an aluminum foil or sheet and applying a heat-resistant resin in the form of a layer to the other surface of the aluminum foil or sheet, wherein a layer of a modified olefin resin formed by melt extrusion is interposed between said aluminum foil or sheet and the crystalline propylene type resin layer and said aluminum foil or sheet is heat-fusion-bonded to the crystalline propylene type resin layer through said modified olefin resin layer and wherein said modified olefin resin is a blend comprising (A) a crystalline modified propylene type polymer having a carbonyl group concentration of 1 to 600 meq/100 g of the polymer, in which at least 80 mole % of the structural olefin units are propylene units, and (B) a modifier selected from the group consisting of (i) low density polyethylene having a density of 0.915 to 0.940 g/cc, (ii) a crystalline modified ethylene type polymer having a carbonyl group concentration of 1 to 600 meq/100 g of the polymer, in which at least 80 mole % of the structural olefin units are ethylene units, and (iii) a combination of at least one member selected from said low density polyethylene (i) and said crystalline modified ethylene type polymer (ii) with at least one member selected from an ethylene-propylene copolymer rubber in which 20 to

80 mole % of the structural units are propylene units and a modified ethylene-propylene copolymer rubber having a carbonyl group concentration of 1 to 600 meq/100 g of the polymer, the amount of said modifier (B) being 3 to 30 parts by weight per 100 parts by weight of said crystalline modified propylene type polymer (A).

4,310,579

ELASTOMERIC ELEMENTS

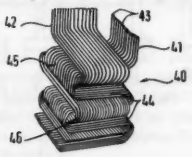
Jan Gaydecki, Leicester, England, assignor to Dunlop Limited, London, England

Filed Jan. 8, 1980, Ser. No. 110,358

Claims priority, application United Kingdom, Jan. 13, 1979, 01336/79; Jan. 13, 1979, 01489/79

Int. Cl.³ B32B 5/12

U.S. Cl. 428—105 19 Claims



1. An elastomeric element having opposing end faces connected to connecting elements which transmit a compression load on said faces, said elastomeric element further including an embedded reinforcement comprising a plurality of parallel interleaving fabric layers spaced apart by a layer of elastomeric material, wherein each fabric layer includes a plurality of elongate reinforcement members extending parallel to one another in which the reinforcement members of successive fabric layers are angled relative to one another, and each fabric layer extends substantially normal to the direction of compression loading of said elastomeric element by said connecting elements.

4,310,580

SHEETING OF MULTILAYER ANTIDRUMMING LINING MATERIAL

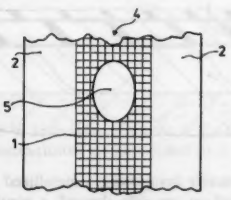
Erhard Sachse, Reiterweg 6a, 6148 HP-Kirschhausen, Fed. Rep. of Germany

Filed Apr. 25, 1980, Ser. No. 143,637

Claims priority, application Fed. Rep. of Germany, May 3, 1979, 2917802

Int. Cl.³ B32B 5/12

U.S. Cl. 428—109 10 Claims



1. A sheeting of multilayer antidrumming lining material which can be fused onto curved tunnel-like sheet metal components, comprising:

a film of plasticizable material,

a reinforcing backing of a wide-meshed fabric having a high tensile strength, said backing fabric being arranged in the middle of the film for covering particularly vertical parts of the tunnel-like sheet metal components, cutaway portions being provided in the middle of the film for the purpose of extending to the vicinity of vertically descending parts of the tunnel-like sheet metal components, and the edges of the cutaway portions are reinforced with additional pieces of wide-meshed fabric.

4,310,581

SURFACE COVERING ARTICLES

Richard E. Felter; Larrimore B. Emmons; John R. Eshbach, Jr., and Thomas Posipanko, all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Feb. 4, 1980, Ser. No. 117,821

Int. Cl.³ B32B 5/12; B60C 9/12; B29H 17/02

U.S. Cl. 428—109 21 Claims

1. A process for producing an article suitable for use as a surface covering, said process comprising embodding, in a unidirectional orientation, a plurality of hollow fibers in a translucent medium to form the article as a solid translucent substrate with an inner and outer surface.

2. A process for producing an article suitable for use as a surface covering, said process comprising embedding, in a unidirectional orientation, a plurality of metallic fibers in a translucent medium to form the article as a solid translucent substrate with an inner and outer surface.

4,310,582

BLENDS OF TRANS-POLYBUTADIENE AND MEDIUM VINYL POLYBUTADIENE

Nelson A. Stumpe, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 20, 1977, Ser. No. 808,001

Int. Cl.³ B32B 3/28; C08L 9/00

U.S. Cl. 428—182 19 Claims

1. A rubbery composition consisting essentially of a blend of (1) medium vinyl polybutadiene containing vinyl-1,2-addition in the range of 25 to 65 percent and (2) high trans polybutadiene containing trans 1,4-addition of at least about 70 percent and being an inherent viscosity no greater than 5, wherein the amount of said high trans polybutadiene is less than 40 weight percent of the total weight of said high trans polybutadiene and said medium vinyl polybutadiene, the inherent viscosity being determined by dissolving the high trans polybutadiene in toluene, determining the viscosity of the polymer solution at 77° F., dividing the viscosity of the polymer solution at 77° F. by the viscosity of the toluene at 77° F. to obtain a relative viscosity, and then dividing the natural logarithm of the relative viscosity by the weight of polybutadiene dissolved in the toluene.

4,310,583

MANUFACTURE OF A GROUP OF INFRA-RED DETECTOR ELEMENTS, AND A GROUP SO MANUFACTURED

Ian M. Baker, Southampton, and Richard B. Withers, Romsey, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 23, 1979, Ser. No. 59,830

Claims priority, application United Kingdom, Jul. 31, 1978, 31751/78

Int. Cl.³ B32B 3/00

U.S. Cl. 428—209 19 Claims

1. A method of manufacturing a group of infra-red detector elements on an insulating substrate, including the steps of:

(a) securing a first surface of a body of infra-red sensitive material to an area of a surface of the substrate;

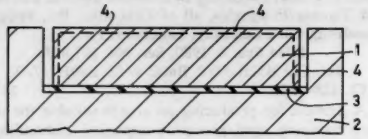
(b) forming a first masking layer of determining a metallization pattern on a second surface of said body, which second surface is opposite said first surface,

(c) depositing metal on said first masking layer, on parts of said body not masked by said first masking layer, and on an area of said surface of the substrate around said body;

(d) removing the said first making layer to lift away the

metal thereon and leave a metallization pattern on the body and substrate;

(e) forming a second masking layer for determining a desired pattern of elements and their electrodes on part of said metallization pattern and on part of said body which is not covered by said metallization pattern; and



(f) using ion-etching to remove parts of said body and parts of said metallization pattern from the substrate while using said second masking layer as an etchant mask so as to divide said body into the elements of the group and to divide the metallization pattern into metal electrodes of the elements.

4,310,584

MULTILAYER LIGHT-REFLECTING FILM

Scott A. Cooper, Yorktown Heights; Ramakrishna Shetty, White Plains, both of N.Y., and Jules Pinsky, Bloomfield, Conn., assignors to The Mearl Corporation, Ossining, N.Y.

Filed Dec. 26, 1979, Ser. No. 107,351
Int. Cl.³ B32B *7/02, 27/06, 27/36*
U.S. Cl. 428—212 **11 Claims**

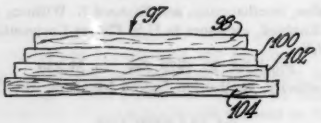
1. A transparent thermoplastic resinous laminate film of at least 10 very thin layers of substantially uniform thickness, said layers being generally parallel, the contiguous adjacent layers being of different transparent thermoplastic resinous materials one of which is a thermoplastic polyester or copolyester resin having a refractive index of 1.55–1.61 and the adjacent resinous material having a refractive index which is lower by at least about 0.03, the contiguous adjacent layers differing in refractive index by at least about 0.03.

4,310,585

FIBROUS PRODUCT FORMED OF LAYERS OF COMPRESSED FIBERS

Richard F. Shannon, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 15, 1979, Ser. No. 48,926
Int. Cl.³ B32B *15/00*
U.S. Cl. 428—218 **18 Claims**



1. A fibrous product comprising a body formed of layers of compressed fibers of inorganic fiber-forming material, an organic binder in the layers of fibers of the body, and an additional hybrid binder comprising an organic binder and an inorganic binder on the fibers of one of the layers of fibers of the product.

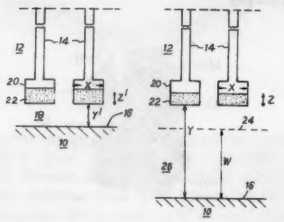
17. A block insulation product comprising a body of layers of fibers of inorganic material, certain of said layers of fibers being impregnated with an inorganic binder, and a surfacing layer of the fibers impregnated with an organic binder.

4,310,586

ALUMINIUM ARTICLES HAVING ANODIC OXIDE COATINGS AND METHODS OF COLORING THEM BY MEANS OF OPTICAL INTERFERENCE EFFECTS

Peter G. Sheasby, Bloxham; Graham Cheetham, Deddington, both of England; Rainer W. M. Stuckart, Achim, Fed. Rep. of Germany, and Tarun K. S. Gupta, Maharahstra, India, assignors to Alcan Research and Development Limited, Montreal, Canada

Continuation of Ser. No. 3,891, Jan. 16, 1979, abandoned. This application Apr. 17, 1980, Ser. No. 140,447
Claims priority, application United Kingdom, Jan. 17, 1978, 1875/78
Int. Cl.³ C25D *11/12, 11/22*
U.S. Cl. 428—220 **15 Claims**



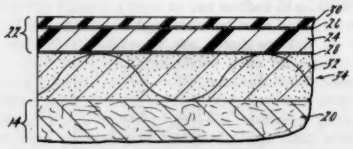
1. An aluminium article having an anodic oxide coating on its surface including a first porous oxide film having a thickness of at least 3 microns, the pores of said film having inorganic pigmentary material deposited therein, the average size of the said deposits at their outer ends, with reference to the aluminium/aluminium oxide interface, being at least 26 nm, the article being coloured by virtue of optical interference, wherein there is present a second oxide film formed between the inorganic pigmentary deposits having a height, and their outer ends being separated from said interface by a distance of from 75 nm to 600 nm, for imparting to said article surface a visually perceptible colour produced by optical interference effects.

4,310,587

FIRE RESISTANT VAPOR BARRIER

Peter M. Beaupre, Billerica, Mass., assignor to King-Seeley Thermos Company, Prospect Heights, Ill.

Filed Mar. 11, 1980, Ser. No. 129,215
Int. Cl.³ B32B *5/22, 5/24, 5/30;* **B05D** *3/06*
U.S. Cl. 428—246 **40 Claims**



8. A vapor barrier comprising a metallized polyester sheet having laminated on one side thereof, a continuous layer of radiation cured resin containing titanium dioxide in an amount sufficient to impart fire resistance thereto, and further having secured on the other side thereof an insulation material.

9. A vapor barrier as recited in claim 8 wherein said polyester sheet is metallized with aluminum.

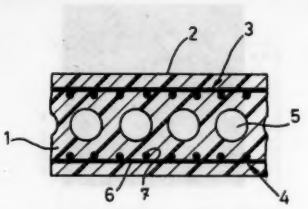
10. A vapor barrier as recited in claim 9 wherein said polyester sheet is metallized on both sides, said insulation material comprises fibrous batting, and a layer of scrim is disposed between said insulation material and said metallized polyester sheet.

4,310,588

SLIDING ELEMENT INTENDED FOR USE IN SKATING

Jean-Michel Bâreel, Avenue du Cerf-Volant, 9, 1170 Bruxelles, Belgium

Filed Mar. 12, 1980, Ser. No. 129,816
Claims priority, application Belgium, Apr. 3, 1979, 194387
Int. Cl.[3] B32B *7/00, 7/02, 27/00, 27/42*
U.S. Cl. 428—251 22 Claims



1. A sliding element intended for use in skating devices comprising a solid slide layer which consists of a self-lubricating synthetic material base resin selected from the group consisting of a silicone resin, a polyvinylidene fluoride resin and a furan resin.

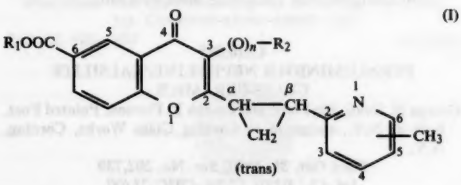
4,310,589

2-(PYRIDYL-CYCLOPROPYL)CHROMONES

Gianfederico Doria, Milan; Ciriaco Romeo, Serino; Maria L. Corno, Milan; Piero Sberze, Varese, and Marcellino Tibolla, Canale d'Agordo, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

Filed Sep. 12, 1980, Ser. No. 186,544
Claims priority, application United Kingdom, Oct. 26, 1979, 37200/79
The portion of the term of this patent subsequent to Jul. 3, 1996, has been disclaimed.
Int. Cl.[3] C07D *405/08;* A61K *31/395*
U.S. Cl. 424—263 12 Claims

1. 2-(Pyridyl-cyclopropyl)chromone derivative of the formula (I)



wherein

n is 0 or 1;

R_1 represents a hydrogen atom or a C_1–C_4 alkyl group which is unsubstituted or substituted by a

group, wherein each of R_3 and R_4 independently represents a hydrogen atom or a C_1 or C_2 alkyl group, thereby providing a basic ester group; R_2 represents a C_2 or C_3 alkyl group or an allyl group, and wherein the methyl group on the pyridine ring is in the 6- or in the 5-position, and pharmaceutically acceptable salts thereof.

9. A method of treating allergies in a patient in need of such treatment, said method comprising administering to said patient an anti-allergic amount of a compound of any one of claims 1, 3 or 4.

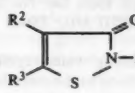
4,310,590

3-ISOTHIAZOLONES AS BIOCIDES

Ramesh B. Petigara, Hatfield, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Dec. 26, 1979, Ser. No. 107,006
Int. Cl.[3] C07D *275/02*
U.S. Cl. 424—270 30 Claims

1. A compound of the formula



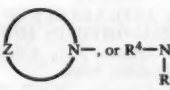
wherein

R^1 is an unsubstituted or substituted alkyl, alkenyl, or alkynyl group of 1 to 18 carbon atoms, an unsubstituted or substituted cycloalkyl group having a 3 to 12 carbon atom ring, an unsubstituted or substituted aralkyl group of up to 10 carbon atoms, or an unsubstituted or substituted aryl group of up to 10 carbon atoms, and is preferably alkyl or aralkyl;

R^2 is hydrogen, halogen, or (C_1–C_4) alkyl;

and

R^3 is —CN,



in which

R^4 and R^5 are, independently, alkyl, aryl, or aralkyl, or aryl or aralkyl of up to 10 carbon atoms, or together from a saturated cycloimino group; and containing 4 to 6 carbon atoms

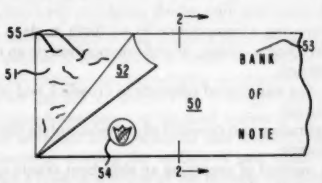
Z is $(—CH_2—)_n$, n being an integer of from 4 to 6, preferably 4 or 5.

4,310,591

SECURITY PAPER FROM FILM-FIBRIL SHEETS

Chi C. Lee, Richmond, Va., and Richard E. Ludwig, Newtown Square, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 7,707, Jan. 30, 1979, Pat. No. 4,247,318. This application Aug. 28, 1980, Ser. No. 181,957
Claims priority, application India, Jan. 28, 1980, 0102/80
Int. Cl.[3] B32B *5/16;* D04H *1/04;* D21D *3/00;* D21H *3/82*
U.S. Cl. 428—283 2 Claims



1. An improved security paper of the type made from bonded webs containing thermoplastic fibers and an intercalary layer of identifying material, the improvement comprising webs consisting essentially of self-bonded nonwoven polyethylene film fibrils, said webs and intercalary layer having been

assembled under a cold compression of at least 17 kg/cm of assembly width during manufacture of the paper, and the paper having an opacity of at least 70% and a delamination resistance of at least 60 grams per centimeter in the plane of the layer containing the identifying material.

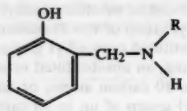
4,310,592

N-(2-HYDROXYBENZYL)ALKYLAMINES AS WATER-REPELLANT AGENTS

Arthur A. Schmitz, Lagrange, Ill., assignor to Akzona Incorporated, Asheville, N.C.

Filed Oct. 29, 1980, Ser. No. 201,680
Int. Cl.³ C07C *85/18;* B05D *3/02;* D04H *1/58;* B32B *21/04*
U.S. Cl. 428—288 **4 Claims**

1. A method of increasing water repellant properties of a material comprising applying to the material an effective water repellant amount of a compound of the formula



wherein R is C_{12}–C_{22} alkyl.

4,310,593

ABSORBENT ARTICLES CURED WITH AMINE-EPIHALOHYDRIN ADDUCTS

James R. Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 796,627, May 13, 1977, abandoned. This application Dec. 22, 1980, Ser. No. 219,072
Int. Cl.³ B32B *27/00;* D02G *3/00;* B32B *27/00;* A01N *1/02*
U.S. Cl. 428—290 **27 Claims**

1. A curable composition useful to form water absorbent articles of a carboxylic synthetic polyelectrolyte which comprises a solution of

(1) a member selected from the group consisting of water, lower alcohols, and mixtures thereof,

(2) about 10 to about 60% by weight based on the amount of (1) of a carboxylic polyelectrolyte or mixtures thereof, and

(3) an amount of a monomeric water soluble amine/epihalohydrin adduct sufficient to cure said polyelectrolyte into a water absorbent article.

13. A method of preparing a water absorbent polyelectrolyte which comprises the steps of

(1) preparing a composition as set forth in claims **1** or **2**,

(2) evaporating about 75% of the solvent therefrom to obtain a substantially dry water-absorbent polyelectrolyte.

14. A method of preparing a substantially dry, water-absorbent polyelectrolyte film which comprises the steps of

(1) preparing a composition as set forth in claim **1** or **2**,

(2) spreading a coating of said composition on an impervious substrate,

(3) drying said coated substrate to crosslink said polyelectrolyte, and

(4) separating said crosslinked polyelectrolyte film from said substrate.

15. A method of preparing an absorbent article coated with a substantially dry water absorbent polyelectrolyte which comprises

(1) preparing a composition as set forth in claim **1** or **2**,

(2) applying a coating of said composition on a relatively thin article,

(3) drying said coated article to crosslink said polyelectrolyte.

4,310,594

COMPOSITE SHEET STRUCTURE

Yasuyuki Yamazaki; Shingo Emi; Susumu Norota; Kazuo Takamatu, and Tomoyoshi Ono, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 1, 1980, Ser. No. 165,079
Int. Cl.³ D04H *3/03, 3/14, 3/16*
U.S. Cl. 428—296 **3 Claims**

1. A composite sheet structure comprising (A) a nonwoven web composed of (a) continuous filaments of a synthetic resin and (B) a net-like web having intersecting points and being composed of (b) continuous net strands of a mixture consisting of at least two thermoplastic synthetic resins having different melting points, said web (A) and said web (B) being bonded to each other by heating; characterized in that

(i) said web (A) has a basis weight of about 2 to about 30 g/m^2,

(ii) said web (B) has a basis weight of about 1 to 10 g/m^2, an average net strand diameter of about 1 to about 100 microns, and an average mesh length of up to about 5 mm, and said net strands (b) are composed of at least two resins having melting points differing from each other by at least about 20° C., of which a resin having the lowest melting point has a melting point at least about 20° C. lower than that of said filaments (a) and is present in an amount of about 5 to about 95% by weight based on the weight of said resin mixture,

(iii) the amount of said web (A) is about 30 to about 90% by weight based on the total weight of said webs (A) and (B),

(iv) said composite sheet structure has a basis weight of about 10 to about 200 g/m^2, and

(v) said filaments (a) are partly embraced by said net strands (b) throughout the composite sheet structure.

4,310,595

PERALUMINIOUS NEPHELINE/KALSILITE GLASS-CERAMICS

George H. Beall, Big Flats, and Joseph E. Pierson, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Oct. 31, 1980, Ser. No. 202,739
Int. Cl.³ B32B *17/06;* C03C *21/00*
U.S. Cl. 428—332 **1 Claim**

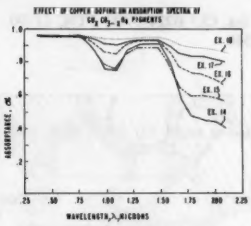
1. A glass-ceramic article extremely resistant to impact and spontaneous delayed breakage, capable of being sawn with a diamond wheel to a depth of over one-third the cross section thereof without breakage, exhibiting a modulus of rupture of at least 150,000 psi, and wherein the crystal present therein have diameters of less than about 0.5 micron, said article consisting of a body portion and an integral surface compression layer having a thickness of at least 0.005", said body portion consisting essentially, expressed in weight percent on the oxide basis, of about 8–13% Na_2O, 7–13% K_2O, 30–36% Al_2O_3, 35–43% SiO_2, and 6–10% RO_2, wherein RO_2 consists of 6–10% TiO_2 and 0–4% ZrO_2, wherein the molar ratio Al_2O_3:SiO_2 is >0.5 but <0.6 and the molar ratio K_2O:Na_2O is $>1:3$ but <1, and containing nepheline solid solution crystals corresponding to the formula $Na_{8-x}K_xAl_8Si_8O_{32}$, with x varying from 0.25–4.73, as the predominant crystal phase, and said surface layer containing kalsilite as the predominant crystal phase.

4,310,596

SOLAR SELECTIVE SURFACES

Oral R. Van Buskirk, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 945,322, Sep. 25, 1978, abandoned. This application Mar. 20, 1980, Ser. No. 132,153
Int. Cl.[3] B32B *27/00*; B05B *5/00*; B05D *3/02, 5/06*
U.S. Cl. 428—336 31 Claims



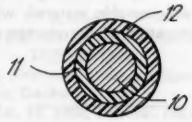
13. A metal substrate having intimately adhered thereto a coating from about 0.5 μm to about 10 μm in thickness which coating consists essentially of from about 40 weight percent to about 80 weight percent of a black spinel pigment selected from the group consisting of Co_3O_4, $CuCr_2C_4$ and Cu_x. $Co_{3-x}O_4$ where x is from 0.03 to 0.3, and from about 20 weight percent to about 60 weight percent of a substantially soluble resinous binder which in polymerized form contains from about 50 to about 95 mole percent vinylidene fluoride, up to about 20 mole percent tetrafluoroethylene, chlorotrifluoroethylene or mixtures thereof, up to 2 mole percent 3(2'-methacryloxyethyl) 2,2-spirocyclohexyl oxazolidine, and the remainder any one or more of methyl methacrylate, hexafluoropropylene, vinyl butyrate, or trifluoromethyltrifluorovinyl ether.

4,310,597

LOW VOLTAGE ELECTRICAL WIRE

John A. Checkland, Pointe Claire, and Paul Valois, Oka, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 922,822, Jul. 10, 1978, abandoned. This application Sep. 12, 1979, Ser. No. 74,729
Int. Cl.[3] B32B *15/02*; H01B *7/00*
U.S. Cl. 428—383 6 Claims



1. A low voltage electrical wire for telecommunications equipment comprising:

(a) an electrical conductor, the conductor being surrounded solely by two layers consisting of an inner layer and outer layer in which;

(i) the inner layer is of polyolefin insulating material surrounding and directly upon the conductor and is more plastic than the outer layer and is a stress relieving layer for the outer layer; and

(ii) the outer layer surrounding the inner layer, said outer layer being an abrasion resistant and flame resistant layer of irradiation crosslinked insulation material consisting essentially of PVC, a mixture of difunctional and trifunctional acrylic monomers and a plasticizer, the PVC content being over 50% and less than 79% by weight of the total composition and the mixture of monomers being less than 30% by weight.

4,310,598

COATED GLASS POWDER HAVING A NEGATIVE COEFFICIENT OF LINEAR THERMAL EXPANSION AND A COMPOSITION CONTAINING THE SAME

Akio Takami, and Kazuo Kondo, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Sep. 21, 1979, Ser. No. 77,810
Claims priority, application Japan, Sep. 21, 1978, 53-116318; Jan. 5, 1979, 54-41
Int. Cl.[3] B32B *15/16, 17/06*
U.S. Cl. 428—406 6 Claims

1. A powder having a negative coefficient of linear thermal expansion which comprises a β-eucryptite particle having on the surface thereof a single layer of or multiple layers of a member selected from the group consisting of tin oxide, titanium oxide, zirconium oxide and a mixture of two or more of said oxides, said oxide being present in a thickness of about 1μ or less.

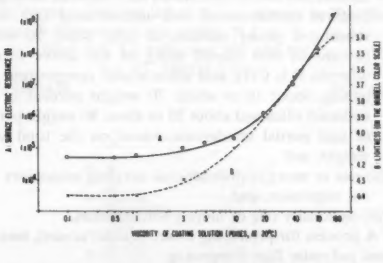
6. A sealing composition comprising a β-eucryptite particle on the surface of which is a single layer of or multiple layers of a member selected from the group consisting of tin oxide, titanium oxide, zirconium oxide and a mixture of two or more of said oxides, said oxide being present in a thickness of about 1μ or less.

4,310,599

MAGNETIC RECORDING ELEMENT

Goro Akashi, and Masaaki Fujiyama, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 271,953, Jul. 14, 1972, abandoned. This application Jun. 18, 1974, Ser. No. 480,332
Claims priority, application Japan, Jul. 14, 1971, 46-52301
Int. Cl.[3] B32B *27/38*
U.S. Cl. 428—413 6 Claims

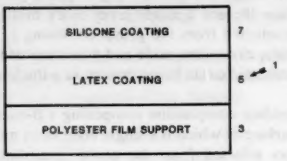


1. A magnetic recording element comprising a magnetic recording layer on a surface of a synthetic resin support and an antistatic layer on the opposite surface of said synthetic resin support which is a single layer consisting essentially of a powder of a hygroscopic inorganic white or light colored pigment and a powder of a carbon type electrically conductive substance in a binder, wherein said white or light-colored pigment powder is present in an amount of about 55 to 72 weight percent and said carbon-type electrically conductive powder is present in an amount of about 3 to 7 weight percent, said weight percents being based on the total weight of the ingredients in said antistatic layer, wherein said antistatic layer has been produced by coating the surface of said synthetic resin support with a coating solution of the powder comprising said layer having a viscosity less than 40 poises at 20° C. and then driving said coating, whereby the pigment powder is substantially all in the outer surface portion of said antistatic layer and said electrically conductive powder is substantially all in the portion of said antistatic layer adjacent said support and said antistatic layer has a surface resistance below 10^7 ohms and a lightness of above 3.6 on the Munsell scale.

4,310,600
POLYESTER FILM HAVING ABRASION RESISTANT RADIATION CURABLE SILICONE COATING

Virginia R. Cross, Houston, Tex., assignor to American Hoechst Corp., Somerville, N.J.

Filed Aug. 29, 1980, Ser. No. 182,334
Int. Cl.³ B32B 27/36, 27/30
U.S. Cl. 428—447 19 Claims



1. A clear, flexible, coated, biaxially oriented polyester film comprising:

(a) a polyester film support;

(b) a silicone coating composition on at least one side of said polyester film support said silicone coating comprising

(i) a silica/silanol composition being derived from a composition comprising a dispersion of colloidal silica in a lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$ in which R is selected from the group consisting of unsubstituted and inertly substituted alkyl radicals having one to three carbon atoms and unsubstituted and inertly substituted pheny radicals, at least about 70 weight percent of said silanol being of the above formula wherein R is CH_3, said silica/silanol composition containing about 10 to about 70 weight percent of said colloidal silica and about 30 to about 90 weight percent of said partial condensate, based on the total solids weight; and

(ii) one or more multifunctional acrylate monomers and-/or oligomers; and

(iii) optionally one or more photoinitiators.

14. A process for producing clear, flexible, coated, biaxially oriented polyester film comprising:

(a) applying to a polyester film support a silicone coating composition on at least one side of said polyester film support said silicone coating comprising:

(i) a silica/silanol composition being derived from a composition comprising a dispersion of colloidal silica in a lower aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$ in which R is selected from the group consisting of unsubstituted and inertly substituted alkyl radicals having one to three carbon atoms and unsubstituted and inertly substituted phenyl radicals, at least about 70 weight percent of said silanol being of the above formula wherein R is CH_3, said silica/silanol composition containing about 10 to about 70 weight percent of said colloidal silica and about 30 to about 90 weight percent of said partial condensate, based on the total solids weight; and

(ii) one or more multifunctional acrylate monomers and-/or oligomers; and

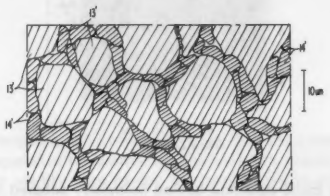
(iii) optionally one or more photoinitiators; and

(b) Radiation curing said silicone coating composition.

4,310,601
METAL HYDRIDE STORAGE DEVICE AND METHOD FOR ITS MANUFACTURE

Otto Bernauer, Weinstadt; Horst Baier, and Helmut Buchner, both of Wendlingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 101,845
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2855476
Int. Cl.³ B22F 5/00; F17C 11/00
U.S. Cl. 428—566 28 Claims



1. A metal hydride storage device with a hydrogenatable storage metal powder and with an encapsulation means of non-hydrogenatable material receiving the storage metal powder, characterized in that the storage metal powder with a substantially uniformly distributed admixture of about 2 to about 10% by weight of a non-hydrogenatable material in powder form forming a matrix powder, in the form of a form-rigid body, is contained in the encapsulation means, whereby increased resistance to disintegration of the storage metal powder is achieved.

10. A method for manufacturing a metal hydride storage device which contains a hydrogenatable storage metal powder in an encapsulation of non-hydrogenatable material, comprising the steps of intimately mixing storage metal powder of a grain size of about 8 to about 20 µm with about 2 to 10% by weight of a non-hydrogenatable matrix metal powder of at most approximately the same grain size, compressing the mixture into a form-rigid body, whereby the granules of the matrix metal powder are plastically deformed between the granules of the storage metal powder and together form a load-bearing cohesive support structure for the granules of the storage metal powder, and encapsulating the form-rigid body in said encapsulation of non-hydrogenatable material, whereby increased resistance to disintegration of the storage metal powder is achieved.

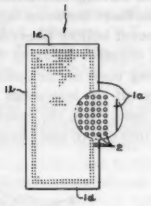
4,310,602
AIR FIN COOLERS

Walter L. Martin, Jr., Lexington, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 969,529, Dec. 14, 1978, Pat. No. 4,214,884. This application Jun. 7, 1979, Ser. No. 46,533
Int. Cl.³ C03B 25/00; B01D 39/10
U.S. Cl. 428—596 4 Claims

1. A blank suitable for forming a hollow tubular blade adapted to be placed between cones of glass issuing from a fiber glass bushing and capable of being supplied internally with cooling fluid comprising a sheet of nickel provided with a plurality of apertures, said apertures being on said sheet in a concentration of between 1200 to 1600 apertures per square inch, each of said apertures being the same size as all others, the apertures being sufficient in number to cover the major portion of said sheet, a border on said sheet of solid nickel enclosing

the area of said apertures, said border being between 0.062 to 0.093 inch (0.159 to 0.236 centimeter) in width said border



providing a welding seam when the blank is bent to form a tubular shape.

4,310,603

DISPENSER CATHODE

Louis R. Falce, Redwood City, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 964,867, Nov. 30, 1978. This application Sep. 13, 1979, Ser. No. 75,349

Int. Cl.³ H01J *19/06*

U.S. Cl. 428—596 **14 Claims**

COMPACT A QUANTITY OF ALKALINE EARTH CARBONATE TO FORM A PELLET
HEAT PELLET IN VACUUM AT 900°C TO CONVERT THE CARBONATE TO AN OXIDE
VACUUM IMPREGNATE THE PELLET WITH WAX OR RESIN
INSERT IMPREGNATED PELLET IN PLACE ON CATHODE SUPPORT STRUCTURE

1. The dispenser cathode wherein said foil is made of tungsten.

4,310,604

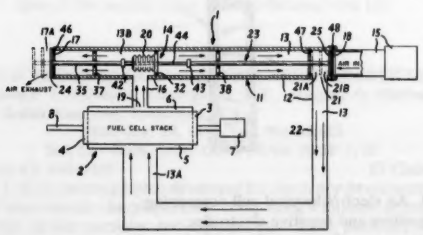
FUEL CELL SYSTEM AND TEMPERATURE CONTROL THEREFORE

Peter G. Marchetti, Newtown, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Filed Jul. 14, 1980, Ser. No. 168,487

Int. Cl.³ H01M *8/04*

U.S. Cl. 429—17 **34 Claims**



1. An electrochemical cell system comprising: a fuel cell having a cathode section and an anode section for receiving incoming process gases, respectively;

and means for maintaining said fuel cell at a first predetermined temperature comprising:

means for combining a first amount of heated process gas outgoing from one of said sections with a second amount of fresh supply process gas to form said incoming process gas for said one section;

and means preceding said combining means and responsive to the temperature of said outgoing heated process gas from said one section for adjusting said first amount of heated process gas and for adjusting said second amount of fresh supply process gas to enable said incoming gas formed by said combining means from said first and second amounts of gases to maintain the temperature of said fuel cell at said first predetermined temperature.

28. A method of producing electrical energy through electrochemical reaction in a fuel cell having anode and cathode sections adapted to receive incoming process gas comprising the steps of:

combining a first amount of heated process gas outgoing from one of said sections with a second amount of fresh supply process gas to form the incoming process gas for that one section;

and preceding said combining step, adjusting said first amount of heated process gas and adjusting said second amount of fresh supply process gas in dependence on the temperature of said outgoing gas from that one section to enable said incoming process gas formed in said combining step from said first and second amounts of gases to maintain the temperature of said cell at a first predetermined temperature.

4,310,605

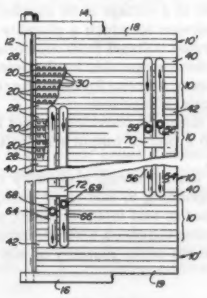
FUEL CELL SYSTEM

Jack Early, Perth Amboy; Arthur Kaufman, West Orange, and Alfred Stawsky, Teaneck, all of N.J., assignors to Engelhard Minerals & Chemicals Corp., Iselin, N.J.

Filed Sep. 22, 1980, Ser. No. 189,466

Int. Cl.³ H01M *8/04*

U.S. Cl. 429—18 **19 Claims**



1. A fuel cell system comprising:

a fuel cell module including

a plurality of fuel cell sub-stacks held together in a stacked arrangement,

each of said sub-stacks having a plurality of fuel cells connected together electrically in series,

means providing a cathode terminal at one end of said series connected fuel cells, and

means providing an anode terminal at the other end of said series connected fuel cells,

and means for electrically connecting together said anode

terminals of said sub-stacks and said cathode terminals of said sub-stacks in parallel,

said fuel cell system producing at power output terminals a voltage output corresponding to the voltage of a sub-stack.

4,310,606

BATTERY VOLTAGE CHECKING DEVICE

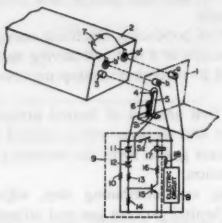
Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 109,279, Jan. 3, 1980, abandoned. This application Oct. 16, 1980, Ser. No. 197,619

Claims priority, application Japan, Feb. 1, 1979, 54-10749[U]

Int. Cl.³ H01M *10/48*

U.S. Cl. 429—93 **23 Claims**



1. A device to which a plurality of cases containing therein batteries capable of applying different nominal voltages are selectively mountable and which checks the battery voltage of a mounted case, comprising:

signal means provided on at least one of said plurality of cases and emitting a discrimination signal to indicate which of said cases has been mounted;

voltage check means including a plurality of voltage check circuits corresponding to said cases to check each of the output voltages of the batteries contained in said plurality of cases; and

selector means operativey associated with said signal means during said mounting to select one of said plurality of voltage check circuits in accordance with said discrimination signal and apply to said selected voltage check circuit the output voltage of the battery contained in said mounted case as a voltage to be checked.

23. In a load device to which a plurality of battery cases having different rated voltages from each other are selectively mountable and which is operable by the output voltage of the mounted battery case, a device for checking the output voltage of the mounted case, comprising:

a pair of input terminals provided on said load device to be connected to a pair of output terminals of the mounted battery case;

voltage check means having a plurality of voltage check levels corresponding to said rated voltages to check the voltage applied to said input terminals; and

means for selecting the check level corresponding to the said rated voltage out of the plurality of said check levels.

4,310,607

BATTERY CELL CONSTRUCTION

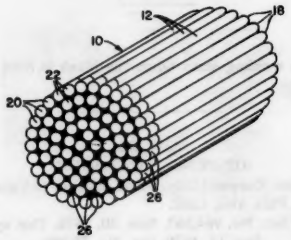
George C. Shay, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 11, 1980, Ser. No. 167,423

Int. Cl.³ H01M *10/39*

U.S. Cl. 429—104 **18 Claims**

1. A battery cell for generating electrical energy which comprises, container means having anode and cathode chambers, said anode and cathode chambers being separated by a combination electrolyte/separator, said electrolyte/separator being in the form of a bundle of hollow fibers having inner and outer surfaces positioned substantially parallel to one another along their longitudinal extent, the interiors of said hollow fibers being open at one end of said separator bundle and sealed closed at the opposite end thereof, said hollow fibers forming said separator bundle having interstices formed along their outer longitudinal surfaces between adjacent hollow fibers, wall portions of adjacent hollow fibers forming said separator bundle being sealed together adjacent the open end thereof forming a solid sealing mass of the same composition as said hollow fibers closing off the interstices between said hollow fibers adjacent their open ends, the outer surfaces of said hollow fibers extending into one of said chambers with the interior



of said hollow fibers being closed off therefrom by said sealed ends, the inner surfaces of said hollow fibers being in open communication with each other and the other chamber with the open ends of such hollow fibers opening into said other chamber, an anolyte communicating with one surface of said separator bundle, a catholyte communicating with an opposite surface of said separator bundle, longitudinally extending cathodic current collecting means within said container means extending substantially along the length of said hollow fibers and surrounded over a major portion of its extent by said catholyte, and anodic current collecting means.

4,310,608

SEPARATOR INCORPORATING LIQUID LAYER

Mark G. Dodin, and Allen Charkey, both of Brookfield, Conn., assignors to Energy Research Corporation, Danbury, Conn.

Filed Nov. 6, 1980, Ser. No. 204,645

Int. Cl.³ H01M *2/16*

U.S. Cl. 429—131 **16 Claims**

1. An electrochemical cell comprising:

positive and negative electrodes;

a separator for separating said electrodes comprising:

a container comprised of a microporous material; and

a liquid polymer solution disposed in said container.

4,310,609

METAL OXIDE COMPOSITE CATHODE MATERIAL FOR HIGH ENERGY DENSITY BATTERIES

Charles C. Liang, Clarence; M. Elizabeth Bolster, East Amherst, and Robert M. Murphy, Lancaster, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed Dec. 17, 1979, Ser. No. 104,384
Int. Cl.[3] H01M 6/14
U.S. Cl. 429—194 30 Claims

1. An electrochemical cell having an anode of a Group 1A metal which is electrochemically oxidizable to form metal ions in the cell upon discharge to generate electron flow in an external electrical circuit connected to the cell and a cathode of electronically conductive material and characterized by an ionic conductive electrolyte solution operatively associated with the anode and the cathode, the cathode comprising a composite oxide matrix of vanadium oxide chemically reacted with at least one other metal selected from the group consisting of groups IB, IIB, IIIB, IVB, VIB, VIIB and VIII, said composite oxide being the thermal decomposition and reaction product of a mixture of vanadium oxide with at least one decomposable metal compound of said groups.

4,310,610

TWO COLOR ELECTROSTATOGRAPHIC PROCESS

Katsuo Sakai, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 25, 1979, Ser. No. 33,316
Claims priority, application Japan, Apr. 27, 1978, 53/50664; May 10, 1978, 53/55789
Int. Cl.[3] G03G 13/01
U.S. Cl. 430—42 6 Claims

1. A two color electrostatographic process comprising the steps of:

(a) providing a photoconductive member having an electrically conductive substrate, a first photoconductive layer formed on the substrate and a second photoconductive layer formed on the first layer, the first and second layers being formed in such a manner that light of a first color radiated onto the second layer renders the first and second layers photoconductive and light of a second color radiated onto the second layer renders only the second layer photoconductive;

(b) forming a first electrostatic charge of a first polarity at an interface between the first and second layers;

(c) forming a second electrostatic charge of a second polarity on the second layer; and

(d) radiating a light image onto the second layer, the light image having a black image area and image areas of the first and second colors respectively;

a magnitude of the second charge being smaller than a magnitude of the first charge to an extent such that an electrostatic potential on the second layer is substantially zero in the image area of the first color; of the second polarity and sufficient magnitude to constitute an electrostatic image for electrostatography in the black image area; and of the first polarity and sufficient magnitude to constitute an electrostatic image for electrostatography in the image area of the second color after performing step (d).

4,310,611

ELECTROGRAPHIC MAGNETIC CARRIER PARTICLES

Edward T. Miskinis, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 29, 1979, Ser. No. 53,613
Int. Cl.[3] G03G 9/00; C04B 35/04; B22F 3/00
U.S. Cl. 430—107 17 Claims

1. In an electrographic developer for use in dry development of electrostatic charge patterns, comprising a mixture of magnetic carrier particles and electroscopic toner particles, the improvement wherein said carrier particles are passivated magnetic stainless steel particles containing at least 9 weight percent chromium, the surfaces of the passivated particles comprising a thin protective layer that is rich in chromium relative to the untreated steel and is more electrically conductive than the oxides of iron.

4,310,612

BLOCKED PHOTOGRAPHICALLY USEFUL COMPOUNDS IN PHOTOGRAPHIC COMPOSITIONS, ELEMENTS AND PROCESSES EMPLOYING THEM

Jared B. Mooberry, and William C. Archie, Jr., both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,462
Int. Cl.[3] G03C 1/40, 1/48, 5/54, 7/00
U.S. Cl. 430—223 42 Claims

1. A photographic element comprising a support, at least one photosensitive silver halide emulsion layer and, associated with the silver halide emulsion layer, a blocked dye capable of providing a photographic image, the blocked dye, under alkaline conditions encountered during processing of the silver halide emulsion layer, being uniformly unblocked without changing the mobility of the dye, the blocked dye having the structure:

DYE—G-E-X-NuP

where:

DYE-G is the residue of a dye capable of providing a photographic image, G being the residue of an auxochromic group of the dye;

E is an electrophilic group;

NuP is a precursor of a nucleophilic group which, under alkaline conditions, is converted uniformly to a nucleophilic group; and

X is a linking group for spatially relating E and NuP to enable them to undergo, after conversion of NuP to a nucleophilic group, an intramolecular nucleophilic displacement reaction which cleaves the bond between E and G.

12. A photographic element comprising a support, at least one photosensitive silver halide emulsion layer and, associated with the silver halide emulsion layer, a blocked dye capable of providing a photographic image, the blocked dye, under alkaline conditions encountered during processing of the silver halide emulsion, being uniformly unblocked without changing the mobility of the dye, the blocked dye having the structure:

CAR—DYE'—G—E—X—NuP

wherein:

CAR is a ballasted carrier moiety linked to DYE' and capable of being detached therefrom and thereby rendering the dye mobile under alkaline conditions as a function of development of the silver halide emulsion;

DYE'-G is the residue of a dye moiety capable of providing a photographic image, G being the residue of an auxochromic group of the dye;

E is an electrophilic group;

NuP is a precursor of a nucleophilic group which, under alkaline conditions, is converted uniformly to a nucleophilic group; and

X is a linking group for spatially relating E and NuP to enable them to undergo, after conversion of NuP to a nucleophilic group, an intramolecular nucleophilic displacement reaction which cleaves the bond between E and G.

14. In a photographic film unit for forming a dye image comprising:

(a) a support having thereon at least one photosensitive silver halide emulsion layer containing an immobile dye releasing compound having joined to an auxochromic group of the dye moiety, a blocking group which shifts the spectral absorption of the dye;

(b) a dye image-receiving layer; and

(c) an alkaline processing composition contained within means from which it can be discharged within the film unit;

the film unit containing a silver halide developing agent, the improvement wherein the dye releasing compound has the structure:

CAR—DYE'—G—E—X—NuP

wherein:

CAR is a ballasted carrier moiety linked to DYE' and capable of being detached therefrom and thereby rendering the dye mobile under alkaline conditions as a function of development of the silver halide emulsion;

DYE'-G is the residue of a dye capable of providing a photographic image, G being the residue of an auxochromic group of the dye;

E is an electrophilic group;

NuP is a precursor of a nucleophilic group which, under alkaline conditions, is converted uniformly to a nucleophilic group and

X is a linking group for spatially relating E and NuP to enable them to undergo, after conversion of NuP to a nucleophilic group, an intramolecular nucleophilic displacement reaction which cleaves the bond between E and G.

28. In an integral photographic assemblage for forming a dye image comprising:

(a) a photosensitive element comprising a transparent support having thereon the following layers in sequence: a dye image-receiving layer; an alkaline solution permeable, light-reflective layer; an alkaline solution permeable, opaque layer; a red-sensitive silver halide emulsion layer having a ballasted cyan dye releasing compound associated therewith, a green-sensitive silver halide emulsion layer having a ballasted magenta dye releasing compound associated therewith; and a blue-sensitive silver halide emulsion layer having a ballasted yellow dye releasing compound associated therewith;

(b) a transparent sheet superposed over said blue-sensitive silver halide emulsion layer and comprising a transparent support having thereon, in sequence, a neutralizing layer and a timing layer; and

(c) a rupturable container containing an alkaline processing composition and an opacifying agent which is so positioned during processing of said assemblage that a compressive force applied to said container will effect a discharge of the container's contents between said transparent sheet and said blue-sensitive silver halide emulsion layer; said assemblage containing a silver halide developing agent; the improvement wherein at least one of said dye releasing compounds has the structure:

CAR—DYE'—G—E—X—NuP

wherein:

CAR is a ballasted carrier moiety linked to DYE' and capable of being detached therefrom and thereby rendering the dye mobile under alkaline conditions as a function of development of the silver halide emulsion;

DYE'-G is the residue of a dye capable of providing a photographic image, G being the residue of an auxochromic group of the dye;

E is an electrophilic group;

NuP is a precursor of a nucleophilic group which, under alkaline conditions, is converted uniformly to a nucleophilic group and

X is a linking group for spatially relating E and NuP to enable them to undergo, after conversion of NuP to a nucleophilic group, an intramolecular nucleophilic displacement reaction which cleaves the bond between E and G.

4,310,613

LIQUID PROCESSING COMPOSITION FOR SILVER COMPLEX DIFFUSION TRANSFER PROCESS

Shigeru Iguchi, and Kazuhiro Emoto, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed May 14, 1980, Ser. No. 149,700
Claims priority, application Japan, May 29, 1979, 54/66503
Int. Cl.³ G03C *5/54, 5/38*
U.S. Cl. 430—251 **12 Claims**

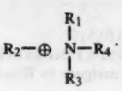
1. A process of forming a transfer image by silver complex diffusion transfer processes which includes the step of effecting development and transfer in the presence of a liquid processing composition which comprises:

(1) an alkaline material,

(2) an alkali metal sulfite,

(3) a silver halide solvent for forming a soluble silver complex salt which diffuses to an image receiving layer having physical development nuclei, and

(4) a compound represented by the following general formula (I):



(I)

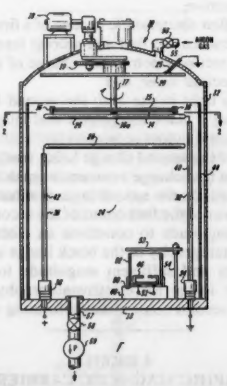
wherein R_1–R_4 represent alkyl groups of 1–5 carbon atoms, aryl groups or aralkyl groups, X represents an anion and the total number of carbon atoms is 10–22.

4,310,614

METHOD AND APPARATUS FOR PRETREATING AND DEPOSITING THIN FILMS ON SUBSTRATES

G. A. Neville Connell, Cupertino, and Richard I. Johnson, Menlo Park, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 19, 1979, Ser. No. 21,731
Int. Cl.³ B05D *3/06*
U.S. Cl. 430—271 **28 Claims**



1. A method for pretreating a glass or plastic surfaced article prior to the deposition of a thin film comprising a coating capable of being ablated upon intense radiation and wherein the molecular characteristic of the thin film to be deposited does not possess good reactive properties with the material of the article to insure an acceptable level of adhesion of the deposited film to the article comprising:

providing a chamber,

rotatably mounting the article in the chamber,

evacuating the chamber,

generating a source of high energy ions in the chamber, the energy distribution of the ions being greater than the energy threshold level necessary to induce sputtering of the article, said energy threshold level characteristic of the material comprising the article and

focusing the generated ions into at least one ion beam for bombardment of the article surface and directing the generated ion beam to a sector of the article surface while rotating the article in the chamber, the bombardment of the ions being maintained for a period of time sufficient to create a plurality of nucleation sites uniformly over a majority of the bombarded article surface.

6. In the manufacture of optically sensitive mediums for optical recording and playback, a method of pretreating and forming a thin film comprising a coating capable of being ablated upon intense radiation, said film of less than 300 A in thickness on the surface of a glass or plastic surfaced article, said film being of uniform thickness, pin-hole free with improved film adhesion and resistance to abrasion comprising the steps of

providing a chamber having an article pretreatment section and an article vapor deposition section,

rotatably mounting the article in the chamber,

evacuating the chamber,

generating a source of high energy ions in the chamber, the energy distribution of the ions being greater than the energy threshold level necessary to induce sputtering of the article, said energy threshold level characteristic of the material comprising the article,

focusing the generated ions into at least one ion beam for bombardment of the article surface and directing the ion beam to a sector of the article surface while rotating the article in the chamber, the bombardment of the ions being maintained for a period of time sufficient to create a plurality of nucleation sites uniformly over a majority of the article surface,

extinguishing the ion bombardment and evacuating the chamber, and

vapor depositing said coating on a sector of the nucleated article surface while rotating the article in the chamber whereby a thin film is uniformly deposited on the nucleated article surface.

13. An optical recording medium comprising a thin film comprising a coating capable of being ablated upon intense radiation having a thickness in the range of 25 A to 300 A deposited on a surface of said article in accordance with the method of any one of the method claims **6**, **7** and **10**.

15. Apparatus for the pretreatment of a surface of a support medium prior to deposition of a thin film on said surface comprising

a chamber,

means in said chamber to rotatably support said medium including drive means to rotate said medium at a desired rotational speed,

a first electrode supported in said chamber adjacent to said medium surface, said first electrode having a planar extent that is in a plane substantially parallel to the plane of said medium and adapted to cover only a sector of said medium surface, said first electrode being a cathode,

a second electrode supported in said chamber in spaced relation from said first electrode, said second electrode having a planar extent substantially parallel to said first electrode, said second electrode being an anode,

means to evacuate said chamber and introduce and maintain a working gas flow through said chamber as said chamber is continuously evacuated,

means to apply a potential between said electrodes to generate a plasma therebetween,

means to control the pressure in said chamber and the amount of said potential whereby the energy distribution in the gas ions established in said plasma is greater than the energy threshold level necessary to induce sputtering of the medium surface, said energy level characteristic of the material comprising said medium, whereby ions from said plasma bombard and sputter said medium sector surface through said first electrode as said medium is rotated in said chamber to create a plurality of nucleation sites uniformly over a majority of said medium surface.

4,310,615

IMAGE TRANSFER ELEMENT HAVING RELEASE LAYER

Ronald S. Steelman, St. Paul, and Rodney J. Larkins, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 680,666, Apr. 27, 1976, abandoned. This application Sep. 10, 1980, Ser. No. 186,147

Int. Cl.[3] **G03C** *1/68, 1/78*

U.S. Cl. 430—271 **7 Claims**

1. A presensitized light sensitive sheet structure suitable for producing a dry transfer element, comprising a thin, flexible, transparent substrate having a release coating thereon, and overlying said release coating and releasably bonded thereby to said transparent substrate a photosensitive layer comprising an addition polymerizable, non-gaseous ethylenically-unsaturated compound containing at least one terminal ethylenic group, a free radical-liberating photo initiator therefor, a pressure-sensitive adhesive, and a binder, said photosensitive layer, after image wise exposure thereof to actinic radiation and removal of unexposed portion of said layer, having greater adhesion at normal room temperature to a receptor surface when applied thereto under pressure than the adhesion of said photosensitive layer to said transparent substrate under like pressure.

4,310,616

METHOD AND APPARATUS FOR DEVELOPING AND TREATING PS PLATES

Shinji Hamada, and Kiichiro Sakamoto, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 15, 1980, Ser. No. 140,542

Claims priority, application Japan, Apr. 19, 1977, 54-48154

Int. Cl.[3] **G03F** *7/02*

U.S. Cl. 430—309 **5 Claims**

1. A method for developing and treating PS plates comprising the steps of: providing a first developing bath and a second developing bath, passing PS plates successively through said first and second developing baths, said transfering treatment liquid used in said second developing bath to said first developing bath.

4,310,617

PROCESS FOR THE PRODUCTION OF MASKED POSITIVE COLOR IMAGES BY THE SILVER DYE BLEACH PROCESS

Herbert Mollet, Tentlingen; Alfred Oetiker, Fribourg, and Carlo Boragine, Villars-sur-Glane, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Aug. 1, 1980, Ser. No. 174,478

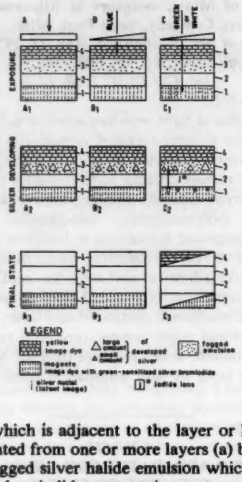
Claims priority, application Switzerland, Aug. 1, 1979, 7078/79

Int. Cl.[3] **G03C** *7/04*

U.S. Cl. 430—359 **19 Claims**

1. A process for the production of masked positive colour images by the silver dye bleach process, by exposing a photographic material for the silver dye bleach process, silver developing, dye-bleaching, silver-bleaching and fixing, optionally, the step of silver-bleaching is carried out in a combined treatment bath together with dye-bleaching and/or fixing, wherein the photographic material contains (a) in at least one layer, at least one first dye, which has at least one undesired secondary colour density which is to be compensated, (b) in the layer or layers (a) and/or in a layer adjacent to the said layer or layers (a), an iodide-containing silver halide emulsion allocated to the said dye or to each of the said dyes, (c) in at least one further

layer, at least, in each case, a second dye, the main colour density of which corresponds to the secondary colour density of the first dye or dyes which is to be compensated, (d) in the layer or layers (c) and/or in a layer or layers adjacent to the said layer or layers (c), a silver halide emulsion which is free from iodide or has a low iodide content compared with the emulsions mentioned under (b) and is allocated to the said dye or dyes, and (e), in at least one layer (c) and/or in at least one



further layer which is adjacent to the layer or layers (c) and which is separated from one or more layers (a) by at least one interlayer, a fogged silver halide emulsion which is free from iodide or has a low iodide content, is spontaneously developable to maximum density without exposure and contains a development retarder, and developing is carried out in a developer solution which does not contain any silver complexing agents.

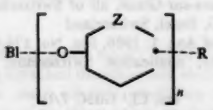
4,310,618

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND PROCESS UTILIZING BLOCKED DYE-FORMING COUPLERS

Jose M. Fernandez, Rochester, and Joseph P. Pepe, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 30, 1980, Ser. No. 154,655
Int. Cl.³ G03C 7/00
U.S. Cl. 430—381 **8 Claims**

1. A photographic element comprising a support and a photosensitive silver halide emulsion having associated therewith a dye-forming coupler having the structure:



wherein:

Z represents the atoms to complete, with the attached oxygen atom, the same 5-pyrazolone magenta dye-forming coupler moiety, phenol cyan dye-forming coupler moiety or naphthol cyan dye-forming coupler moiety, the * in the ring completed by Z representing the coupling position;

R is hydrogen or a coupling-off group;

Bl is a blocking group removable, during development, from the coupler moiety completed by Z to which it is directly attached, thereby to activate the coupling position of the coupler moiety; and

n is an integer of 2 to 4.

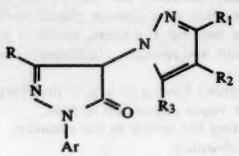
4,310,619

COLOR PHOTOGRAPHIC MATERIAL AND PROCESS INCORPORATING A NOVEL MAGENTA COUPLER

Seiji Ichijima; Yoshiharu Yabuki; Toshiyuki Watanabe, and Nobuo Furutachi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 3, 1980, Ser. No. 126,934
Claims priority, application Japan, Mar. 5, 1979, 54-25426
Int. Cl.³ G03C 7/00, /140
U.S. Cl. 430—387 **25 Claims**

17. A process for forming a color photographic image which comprises processing a silver halide color photographic light-sensitive material in the presence of a 5-pyrazolone magenta coupler represented by the following formula (I):



(I)

wherein R represents an acylamino group, an anilino group or a ureido group; R_1, R_2 and R_3, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, an alkoxy group, an aryloxy group, a carboxy group, an aryl group or a heterocyclic group wherein said group may be substituted and R_1 and R_2 may combine to form a 2-imidazolyl group, provided that R_1, R_2 and R_3 are not hydrogen atoms at the same time; and Ar represents a phenyl group which may be substituted with one or more halogen atoms, alkyl groups, alkoxy groups or cyano groups.

4,310,620

METHOD OF PROCESSING A PHOTOGRAPHIC MATERIAL USING A PROCESSING LIQUID

Rudolf Meyer, Leverkusen, Fed. Rep. of Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 7, 1979, Ser. No. 18,111
Claims priority, application Fed. Rep. of Germany, May 10, 1978, 2810465
Int. Cl.³ G03C 5/30
U.S. Cl. 430—404 **6 Claims**

1. A process for processing a photographic material of a single-layered or multi-layered photosensitive material with a low viscosity processing liquid comprising the steps of contacting a surface of the uppermost layer of the photographic material with a spreading element consisting essentially of a material

having the characteristics of providing distribution of liquid by capillary forces in a very thin flat porous spreading means,

transferring a processing liquid from a reservoir of said liquid into the flat porous spreading means,

circulating additional processing liquid from said reservoir of said liquids to said contact with the photographic material by rapid distribution of the liquid through the flat porous spreading means and over the surface of the photographic material,

while the spreading means is in contact with said processed photographic material

distributing the processing liquid in the flat porous spreading means, including additional liquid over the surface of the photographic material by capillary force,

and processing the photographic material with the processing liquid contacting the photographic material only upon the surface contact of the element with the photographic material surface,

while the spreading means is in contact with the photographic material.

4,310,621
PHOTOSENSITIVE PHOTOGRAPHIC MATERIAL, A PROCESS FOR THE PRODUCTION OF PHOTOGRAPHIC IMAGES, DEVELOPMENT BATHS AND NEW HYDROQUINONES

Heinrich Odenwälder, Cologne; Karl Frank, and Reinhard Müller, both of Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

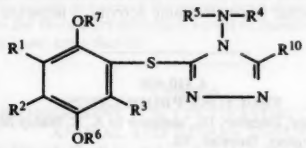
Filed Dec. 16, 1980, Ser. No. 217,193

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1979, 2952280

Int. Cl.³ G03C *5/30, 1/06*

U.S. Cl. 430—443 **9 Claims**

1. A photographic material comprising a support and at least one photosensitive silver halide emulsion layer and further layers which contains a DIR-compound in one layer, wherein the DIR-compound corresponds to formula (I) below



(I)

in which

R^1, R^2 and R^3 represent hydrogen, a hydrocarbon radical which may be substituted, a heterocyclic radical which may be substituted, an alkylthio, alkyloxy or arylthio radical which may be substituted, an amino group which may be substituted, OH or halogen, or R^1 and R^2 together represent the atoms required to complete a carbocyclic or heterocyclic ring,

R^4 and R^5 represent hydrogen, an alkyl radical which may be substituted or an acyl radical which may be substituted or, may together, form the radical

R^6 and R^7 represent hydrogen or a radical capable of being split off in alkaline solution,

R^8 and R^9 represent hydrogen, an alkyl or aryl radical which may be substituted or a heterocyclic radical which may be substituted, and

R^{10} represents hydrogen, an aryl radical or an alkyl radical.

4,310,622
PHOTOGRAPHIC DEVELOPMENT PROCESS

Shinzaburo Onda; Elichi Okutsu; Isamu Itoh, and Hiroyuki Mifune, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

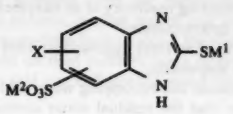
Filed Aug. 1, 1980, Ser. No. 174,428

Claims priority, application Japan, Aug. 3, 1979, 54-99181

Int. Cl.³ G03C *5/30*

U.S. Cl. 430—445 **8 Claims**

1. A process for developing a black-and-white silver halide photosensitive material comprising the steps of: imagewise exposing the material; and treating the material with a developing solution containing a sludge preventing compound in an amount of about 0.01 to 1.0 g per liter of developing solution represented by the formula (I)



(I)

wherein X represents hydrogen, a hydroxyl group, a lower alkyl group having 1 to 5 carbon atoms, a lower alkoxy group having 1 to 5 carbon atoms, a halogen atom, a carboxyl group or a sulfo group, and M^1 and M^2, which may be the same or different, each represents hydrogen, an alkali metal atom, or an ammonium group.

4,310,623
COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Toshiyuki Watanabe, and Masakazu Morigaki, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

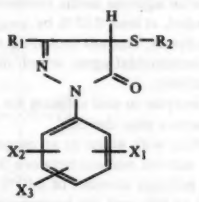
Filed Dec. 15, 1980, Ser. No. 216,714

Claims priority, application Japan, Dec. 14, 1979, 54-163167; Dec. 14, 1979, 54-163168

Int. Cl.³ G03C *1/48, 1/40*

U.S. Cl. 430—505 **24 Claims**

1. A color photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer containing at least one coupler represented by formula (I)



(I)

wherein R_1 represents an anilino group, an acylamino group or a uriedo group, R_2 represents an aralkyl group, an alkyl group or an alkenyl group, X_1, X_2, and X_3 each represents hydrogen, an alkyl group, a halogen atom, an alkoxy group, an aryloxy group, an acylamino group, a carbamoyl group, a sulfamoyl group, a sulfonyl group, or a cyano group, and at least one of said silver halide emulsion layer and a hydrophilic colloid layer adjacent thereto containing a 1-phenyl-3-pyrazolidone compound having a diffusion resistant group in the presence of an organic solvent having a high boiling point for a photographic additive.

4,310,624
STABILIZED LIQUID COENZYME COMPOSITIONS FOR DIAGNOSTIC DETERMINATIONS

Ivan E. Modrovich, 1043 Mesa Dr., Camarillo, Calif. 93010

Continuation-in-part of Ser. No. 764,826, Feb. 2, 1977, Pat. No. 4,153,511, which is a continuation of Ser. No. 667,857, Mar. 17, 1976, abandoned. This application Mar. 9, 1977, Ser. No. 775,833

The portion of the term of this patent subsequent to May 8, 1996, has been disclaimed.

Int. Cl.³ C12Q *1/00, 1/32, 1/48;* C12N *9/00*

U.S. Cl. 435—4 **20 Claims**

1. A method of stabilizing a labile coenzyme used in biological diagnostic determinations and which coenzyme is normally unstable in aqueous media, said method comprising the steps of:

dissolving the coenzyme in a non-reactive, water-miscible, organic solvent which is liquid at least at room tempera-

tures to form a solution thereof, said coenzyme cooperating with and affecting reactivity of an enzyme in a biological diagnostic determination;

adding at least 1% of an inert hygroscopic solid to the solution to form a suspension;

stirring the suspension and entrapping water with the hygroscopic solid so that the residual water content is below 0.5% and where activity of the coenzyme remains unaffected by the presence of the organic solvent in the stabilized composition or in a biological diagnostic determination reaction; removing the hygroscopic solid from the suspension; and sealing the solvent with said coenzyme dissolved therein.

4,310,625

STABILIZED LIQUID ENZYME COMPOSITIONS FOR DIAGNOSTIC DETERMINATIONS

Ivan E. Modrovich, 591 Beverly Dr., Camarillo, Calif. 93010

Continuation of Ser. No. 667,856, Mar. 17, 1976, abandoned. This application Apr. 24, 1978, Ser. No. 898,704

Int. Cl.³ C12Q *1/32, 1/50, 1/52;* C12N *9/96*

U.S. Cl. 435—15 **26 Claims**

1. A method of stabilizing a labile enzyme used in biological diagnostic determinations and which is unstable in an aqueous media, said method comprising the steps of:

forming a solution of the enzyme molecule selected from the class consisting of malate dehydrogenase and lactate dehydrogenase in an aqueous media containing 20% to 40% of 1,2-propanediol, at least 0.05% by weight of water-soluble gelatin polymer, and salt including a substrate and a buffer, and a bactericidal agent which inhibits deterioration of said enzyme;

maintaining the enzyme in said solution for a time sufficient to stabilize reactive sites thereof;

diluting the solution with water to an enzyme content of at least 100 I.U., solvent content between 0.05% and 5%, a water-soluble polymer content of 0.05% to 0.5%, a salt content of 1% to 8%; and the bactericidal agent content from 0.01% to 0.03%

and storing the diluted composition at refrigerator temperatures for a period over one month without significant loss of enzymatic activity.

4,310,626

INTERFERENCE-RESISTANT COMPOSITION, DEVICE AND METHOD FOR DETERMINING A PEROXIDATIVELY ACTIVE SUBSTANCE IN A TEST SAMPLE

Alan E. Burkhardt, Elkhart, Ind., and Ann M. Tideman, Edwardsburg, Mich., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jun. 2, 1980, Ser. No. 155,318

Int. Cl.³ C12Q *1/28*

U.S. Cl. 435—28 **23 Claims**

1. In a composition for detecting the presence of a peroxidatively active substance in a test sample, the composition comprising an organic hydroperoxide selected from the group consisting of t-butyl hydroperoxide, cumene hydroperoxide, diisopropylbenzene hydroperoxide, 2,5-dimethylhexane-2,5 dihydroperoxide, paramenthane hydroperoxide, or mixtures thereof, and an indicator capable of providing a detectable response in the presence of peroxide and the peroxidatively active substance,

the improvement wherein the composition is rendered resistant to adverse effects of ascorbate by the presence in the composition of a complex of Co(III).

4,310,627

PROCESS OF PRODUCING 3-TREHALOSAMINE BY FERMENTATION

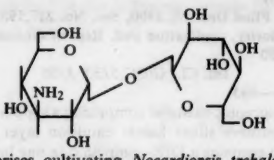
Lester A. Dolak, Plainwell; Alice L. Laborde, Kalamazoo, and Thomas M. Castle, Portage, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 76,489, Sep. 17, 1979, Pat. No. 4,276,412. This application Oct. 9, 1980, Ser. No. 195,561

Int. Cl.³ C12P *19/26*

U.S. Cl. 435—84 **2 Claims**

1. A process for preparing 3-trehalosamine which has the following structural formula:



which comprises cultivating *Nocardiopsis trehalosei* sp nov. having the identifying characteristics of NRRL 12026 in an aqueous nutrient medium under aerobic conditions until substantial antibiotic 3-trehalosamine activity is imparted to said medium.

4,310,628

FRUCTOSE PRODUCTION

Roger S. Leiser, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Continuation of Ser. No. 662,199, Feb. 26, 1976, abandoned. This application Mar. 14, 1980, Ser. No. 130,276

Int. Cl.³ C12P *19/24;* C12N *9/92*

U.S. Cl. 435—94 **11 Claims**

1. A process for increasing fructose yields in a continuous glucose isomerization process employing a fixed bed of immobilized glucose isomerase in which the immobilized isomerase is characterized as being obtained from the Bacillus genera and exhibiting an enhanced rate of isomerizing dextrose to fructose when the glucose isomerization reaction is conducted: (a) in the presence of Co^{++} ions and (b) at a temperature greater than about 60° C., said process comprising:

(A) providing a refined monosaccharide feed syrup which is essentially free from Co^{++} ions and containing on a total dry solids weight basis at least 90% monosaccharide;

(B) isomerizing the feed syrup to fructose by continuously passing the syrup through a bed of immobilized glucose isomerase at an isomerization temperature ranging from about 55° C. to 61° C. and an isomerization pH from 7.0–7.5;

(C) recovering the isomerized syrup while replenishing the bed with a compensatory amount of feed syrup; and

(D) continuing the feed syrup isomerization in said bed with said isomerase for at least 2,000 hours, while maintaining the isomerization temperature from about 55° C. to 61° C. and the pH from 7.0 to 7.5 for at least 90% of the operational time said bed is used to isomerize said feed syrup; and

(E) terminating the isomerization after the isomerase activity of said bed is less than 20% of its optimum activity level.

4,310,629

CONTINUOUS FERMENTATION PROCESS FOR PRODUCING ETHANOL

Werner C. Muller, Dobbs Ferry, N.Y., and Franklyn D. Miller, Cincinnati, Ohio, assignors to National Distillers & Chemical Corp., New York, N.Y.

Filed Apr. 3, 1980, Ser. No. 137,074

Int. Cl.³ C12P *7/14*

U.S. Cl. 435—162 **13 Claims**

1. In a continuous ethanol fermentation process in which a

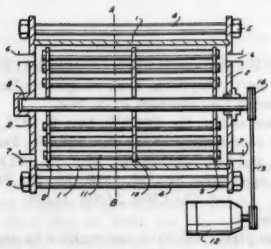
stream of sterile sugar liquor and a quantity of viable yeast cells are introduced into a first fermentation vessel wherein initial fermentation is carried out under conditions favoring a high level of yeast cell propagation, effluent from the first fermentation vessel containing ethanol, sugar and yeast cells is introduced into a second fermentation vessel wherein further fermentation is carried out under conditions favoring a high rate of fermentation of sugar to ethanol, and effluent from the second fermentation vessel is separated into a yeast stream and a substantially yeast-free aqueous ethanol stream with the yeast stream being recycled to the first and/or second fermentation vessel, the improvement which comprises:

(a) separating effluent from the first fermentation vessel into a first yeast stream and a first substantially yeast-free aqueous ethanol stream;
(b) recycling as much of the first yeast stream as necessary to the first fermentation vessel to maintain a high level of yeast cells therein;
(c) introducing the remaining portion of the first yeast stream to the second fermentation vessel;
(d) introducing the first, substantially yeast-free aqueous ethanol stream into the second fermentation vessel;
(e) separating effluent from the second fermentation vessel into a second yeast stream and a second, substantially yeast-free aqueous ethanol stream; and,
(f) recycling as much of the second yeast stream as necessary to the second fermentation vessel to maintain a high level of yeast cells therein.

4,310,630
ARRANGEMENT FOR CULTIVATING CELLS OF ANIMAL AND HUMAN TISSUES

Henry Girard, Burtigny/Vd, and Rudolf Bühler, Wolfhausen, both of Switzerland, assignors to Chemap AG, Männedorf, Switzerland

Continuation of Ser. No. 934,315, Aug. 16, 1978, Pat. No. 4,228,242. This application Mar. 13, 1980, Ser. No. 130,261
Claims priority, application Switzerland, Aug. 16, 1977, 10058/77
The portion of the term of this patent subsequent to Oct. 14, 1997, has been disclaimed.
Int. Cl.³ C12M *3/00*
U.S. Cl. 435—284 **14 Claims**



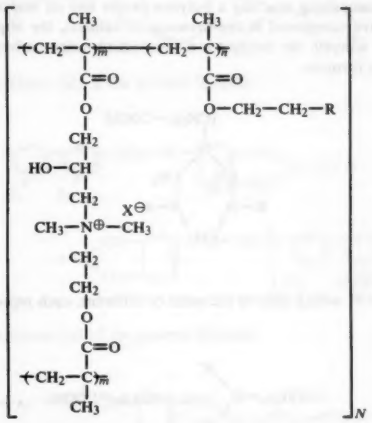
1. An apparatus for cultivating cells of animal and human tissues, comprising a container which forms an inner chamber having an axis; means for introducing a nutrient medium into said inner chamber so as to only partially fill the latter; a plurality of tubular cell supporting elements located in said chamber and extending substantially in an axial direction of the latter, each of said tubular cell supporting elements forming an inner passage and having an inner surface and an outer surface, the inner passage of each of said tubular cell supporting elements having an axis and two axially spaced open ends so that the nutrient medium not only surrounds said tubular cell supporting elements from outside but also fills said inner passages, and cells are cultivated both on the inner surfaces and on the outer surfaces of said tubular cell supporting elements; means for rotating said tubular cell supporting elements during the entire cultivation process about said axis of said inner chamber and relative to said container; and means for tilting said tubular cell supporting elements from the horizontal during the entire cultivation process, so that one of said open ends of each of said inner passages is located above the other of said open ends, whereby the nutrient medium flows in each of said inner passages from said one end toward said other end.

4,310,631
SYNTHESIS OF WATER SOLUBLE CROSS-LINKERS AND THEIR USE IN THE MANUFACTURE OF ANIONIC POLYMERS

Russell J. MacDonald, Woburn, Mass., assignor to Ionics Inc., Watertown, Mass.

Division of Ser. No. 84,337, Oct. 12, 1979, Pat. No. 4,275,227. This application Dec. 13, 1980, Ser. No. 217,494
Int. Cl.³ B01J *41/04*
U.S. Cl. 521—38 **9 Claims**

1. An ion exchange, cross-linked, polymeric structure comprised essentially of a plurality of recurring units of the formula:



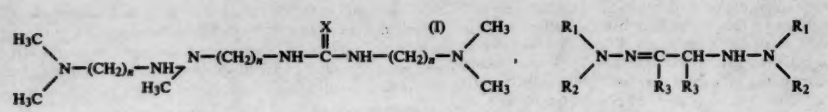
where n is 0 to 0.75 mole fraction of m and wherein R is a member selected from a quaternary ammonium and tertiary amine group and X represents a univalent anion of an acid.

4,310,632
PROCESS FOR THE MANUFACTURE OF POLYURETHANE FOAM

Heinrich Horacek, Ludwigshafen; Manfred Barl, Otterstadt; Rolf Wurmb, Heidelberg, and Matthias Marx, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 26, 1981, Ser. No. 228,120
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1980, 3003963
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—121 **8 Claims**

1. A process for the manufacture of a polyurethane which comprises reacting an organic polyisocyanate with a higher molecular weight organic polyhydroxyl compound in the presence of one or more of a catalyst having the following formula:



wherein X is sulfur or imino (NH) and n is a whole number from 2 to 6.

4,310,633

HEXAHYDROTRIAZINE CARBOXYLATES AND THE USE THEREOF AS CATALYSTS IN THE PRODUCTION OF POLYISOCYANURATE PLASTICS

Peter Haas, Haan; Johannes Blahak, Cologne, and Rolf Wiedermann, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

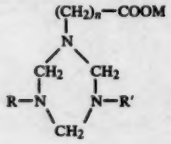
Division of Ser. No. 51,789, Jun. 25, 1979, Pat. No. 4,260,754. This application Nov. 12, 1980, Ser. No. 206,112

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1978, 2829670

Int. Cl.³ C08G *18/14, 18/20;* C07D *251/04*

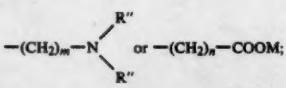
U.S. Cl. 521—129 5 Claims

1. In a process for the production of polyisocyanurate plastics comprising reacting a polyisocyanate and an isocyanate-reactive compound in the presence of catalyst, the improvement wherein the catalyst is a hexahydrotriazine carboxylate of the formula:



wherein

R and R′ which may be the same or different, each represents



R″ represents C_1–C_3 alkyl;

m represents an integer of from 2 to 6;

n represents an integer of from 1 to 10; and

M represents an alkali metal or N‴$_4$

wherein NR‴$_4$ represents H or C_1–C_4 alkyl.

4,310,634

NOVEL POLYISOCYANURATE CATALYST

Edward E. McEntire, and Robert L. Zimmerman, both of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Division of Ser. No. 85,184, Oct. 15, 1979, abandoned. This application Dec. 15, 1980, Ser. No. 216,403

Int. Cl.³ C08G *18/16*

U.S. Cl. 521—115 8 Claims

1. In a process for preparing a polymer containing recurring isocyanurate and urethane linkages, which polymer comprises the reaction product of a polyol and an aromatic polyisocyanate, while utilizing an isocyanurate group formation catalyst; the improvement which comprises

employing as said isocyanurate catalyst a compound falling within the following structural formula:

where R_1 and R_2 are independently selected from alkyl groups of less than about 3 carbon atoms or where R_1 and R_2 together comprise cycloalkyl or morpholino groups and where R_3 is hydrogen or alkyl groups containing less than about 3 carbon atoms.

4,310,635

FERMENTATIVE PRODUCTION OF D(−)-β-HYDROXYISOBUTYRIC ACID

Junzo Hasegawa, Akashi; Masahiro Ogura, Ono; Shigeki Hamaguchi, Akashi; Masami Shimazaki, Takasago; Hajime Kawaharada, Kakogawa, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

Filed Oct. 27, 1980, Ser. No. 201,337

Claims priority, application Japan, Nov. 6, 1979, 54-144252; Nov. 6, 1979, 54-144253; Feb. 14, 1980, 55-17559; Jul. 7, 1980, 55-103805

Int. Cl.³ C12P *7/42*

U.S. Cl. 435—146 13 Claims

1. A process for producing D(−)-β-hydroxyisobutyric acid which comprises subjecting a substrate selected from the group consisting of isobutyric acid, methacrylic acid, and a mixture of isobutyric acid and methacrylic acid to the action of a microorganism having the ability to convert the substrate into D(−)-β-hydroxyisobutyric acid in an aqueous medium and recovering D(−)-β-hydroxyisobutyric acid from the medium.

4,310,636

COPPER ADHESIVE COMPOSITION

Kenneth W. Bartz, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 746,930, Dec. 8, 1976, abandoned, which is a continuation of Ser. No. 554,276, Feb. 28, 1975, abandoned, and Ser. No. 340,061, Mar. 12, 1973, abandoned. This application Sep. 28, 1978, Ser. No. 946,894

Int. Cl.³ C08L *51/04, 51/06*

U.S. Cl. 525—71 3 Claims

1. A thermoplastic adhesive composition having outstanding adhesion to copper comprising a blend of

(a) about 90 weight percent of polypropylene; and elastomeric impact blend comprising polypropylene, high density polyethylene and an ethylene/propylene copolymer elastomer;

wherein both said polypropylene and said elastomeric impact blend have been grafted with from 0.02 to 20 weight percent of a monomer selected from glycidyl acrylate.

2. A thermoplastic adhesive composition having outstanding adhesion to copper comprising a blend of

(a) about 75 weight percent of polypropylene; and

(b) about 25 weight percent of a reactor copolymer of ethylene and propylene;

wherein both said propylene and said reactor copolymer have been grafted with from 0.02 to 20 weight percent of a monomer selected from glycidyl acrylate.

4,310,637

HIGH IMPACT COMPOSITIONS CONTAINING POLYCYANO NORBORNENES

Elmer J. Dewitt, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 9, 1981, Ser. No. 232,610
Int. Cl.³ C08L 51/00
U.S. Cl. 525—75 10 Claims

1. Thermoplastic composition having both improved impact strength and melt flow comprising 2 to 30 parts by weight of a halogenated polyolefin; 5 to 100 parts by weight of an ABS resin that is a polymerization product of a vinyl aromatic compound, an acrylic nitrile, and a conjugated diene; and 100 parts by weight of a polycyano norbornene.

4,310,638

NYLON MODIFIED ACRYLIC COPOLYMER RUBBER

Aubert Y. Coran, and Raman Patel, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 20, 1980, Ser. No. 179,921
Int. Cl.³ C08L 77/00
U.S. Cl. 525—183 12 Claims

1. An elastoplastic composition comprising a blend of 98 to 60 parts by weight of neutralized acid containing acrylic copolymer rubber and about 2 to 40 parts by weight of nylon per 100 parts by weight of said rubber and nylon combined.

4,310,639

POLYALLOMERS AND PROCESS FOR PREPARING SAME

Hugh J. Hagemeyer, Jr., and Marvin B. Edwards, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 152,001, Nov. 13, 1961, abandoned, which is a continuation-in-part of Ser. No. 668,840, Jul. 1, 1957, abandoned, and Ser. No. 28,826, May 13, 1960, abandoned. This application Oct. 26, 1965, Ser. No. 505,227
Int. Cl.³ C08F 297/08
U.S. Cl. 525—247 12 Claims

1. A block copolymer the chains of which consist essentially of crystalline polymerized propylene segments chemically joined to crystalline segments of polymerized α-monoolefinic hydrocarbon other than propylene, said block copolymer having an inherent viscosity in tetralin at 145° C. of from about 0.4 to 2.4, a density of at least 0.85, a brittle point below 0° C. and containing at least 80 percent, by weight, of polymerized propylene.

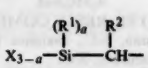
4,310,640

CURABLE COMPOSITION

Yasushi Kato; Hisao Furukawa; Shoichi Matsumura, all of Kobe, and Saori Nakatsuka, Ashiya, all of Japan, assignors to Kanegafuchi Kogaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 16, 1980, Ser. No. 150,638
Int. Cl.³ C08C 19/00; C08F 8/00, 8/42
U.S. Cl. 525—100 12 Claims

1. A curable composition comprising an organic polymer having at least one hydrolyzable silyl group and; and a catalyzer selected from the group consisting of an organic amine selected from the group consisting of aliphatic diamines, aliphatic polyamines, aliphatic cyclic amines, aromatic amines, ethanol amines and triethylamines alkali metal hydroxides and mixtures; wherein said silyl group is shown by the formula:



wherein R^1, R^2 is hydrogen or monovalent, hydrocarbon group, X is a hydrolyzable group selected from the group consisting of halogen alcoxyl group, hydroxyl group, aminoxyl group, phenoxyl group, thioalcoxyl group and amino group, and "a" is an integer 0, 1 or 2 wherein said polyester having said silyl groups at their ends or in their side chains and having a molecular weight of from 300 to 8,000 and said vinyl polymers being copolymers of allyl acrylate or allyl methacrylate with vinyl monomers and having a molecular weight of 300 to 20,000.

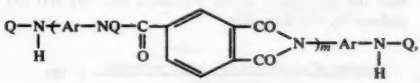
4,310,641

HEAT RESISTANT PHOTORESIST COMPOSITION AND PROCESS FOR PREPARING THE SAME

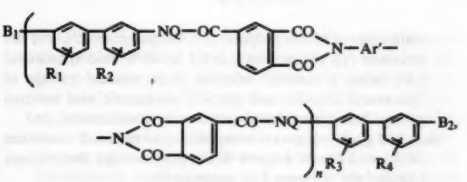
Kaoru Ohmura; Ichiro Shibasaki; Takeo Kimura, and Muneaki Kimura, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 961,534, Nov. 16, 1978, Pat. No. 4,180,404. This application Aug. 1, 1979, Ser. No. 62,800
Claims priority, application Japan, Nov. 17, 1977, 52-137256; Dec. 28, 1977, 52-157481
Int. Cl.³ C08F 283/04; C08G 63/76
U.S. Cl. 525—419 9 Claims

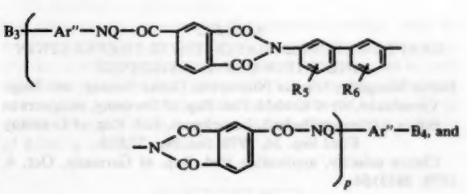
1. A polymer selected from the group consisting of a polymer (α) of the general formula



a polymer (β) of the general formula



a polymer (γ) of the general formula

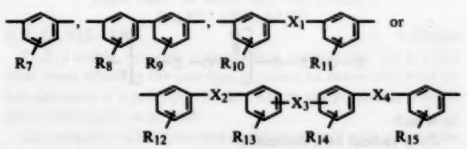


and mixtures thereof

wherein

R_1 to R_6 are the same or different and each represent a hydrogen atom, a (C_1–C_4) alkyl group or a halogen atom,

Ar represents

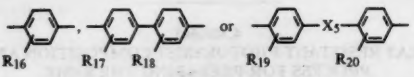


wherein

R_7 to R_{15} are the same or different and each have the same

meaning as defined with respect to R_1 to R_6 and X_1 to X_4 are the same or different and each represent —O—, —SO_2—, —CH_2—, —CO—, —COO—, —$C(CH_3)_2$—, —S— or —$(CH_2)_2$—,

Ar′ represents



wherein R_{16} to R_{20} are the same or different and each have the same meaning as defined with respect to R_1 to R_6 and X_5 has the same meaning as defined with respect to X_1 to X_4,

Ar″ has the same meaning as defined with respect to Ar or Ar′,

B_1 to B_4 are the same or different and each represent —NCO or a substituent (A) formed by the reaction of —NCO with cinnamic acid or cinnamyl alcohol, each Q independently represents a hydrogen atom or a substituent (A′), provided that each of the rates of substituent introduction into the molecules of the polymers (α), (β) and (γ) as defined by the formulae

$$\frac{\text{number of substituent } (A') \text{ in the molecule}}{m+2} \times 100,$$

$$\frac{\text{number of substituents } (A) + (A') \text{ in the molecule}}{2 \times n + 2} \times 100 \text{ and}$$

$$\frac{\text{number of substituents } (A) + (A') \text{ in the molecule}}{2 \times p + 2} \times 100$$

with respect to the polymer (α), the polymer (β), and the polymer (γ), respectively, is 0.1 to 50%, said substituent (A′) being a member selected from residual groups of cinnamoyl chloride and glycidyl cinnamate, said residual groups being introduced alone or in combination, and

m, n and p are integers corresponding to reduced viscosities of 0.1 to 2.0 with respect to the polymer (α) the polymer (β) and the polymer (γ), respectively.

4,310,642

GRAFT POLYCARBONATES, THEIR PREPARATION AND THEIR USE AS MOLDINGS

Dieter Margotte; Werner Nouvertne; Dieter Neuray, and Hugo Vernaleken, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

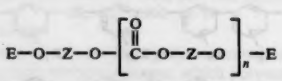
Filed Sep. 24, 1979, Ser. No. 77,978

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843154

Int. Cl.³ C08L *69/00*

U.S. Cl. 525—468 **5 Claims**

1. A process for the production of soluble thermoplastic graft polycarbonate with a molecular weight (weight average Mw) of about 30,000 to 400,000, in which an aromatic polycarbonate with on average at least one unsaturated end group per polycarbonate molecule, having the formula II

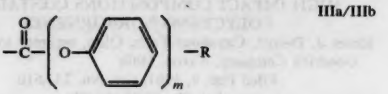


in which

Z=a radical of a diphenol,

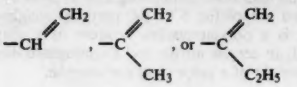
n=an integer from 30 to 100, and

E represents a saturated end group of the formula IIIb or an unsaturated end group of the formula IIIa



IIIa/IIIb

in which for IIIa, m denotes zero and R denotes



and in which for IIIb, m is zero and R is C_1–C_{18}-alkyl or m is 1 and R is H, alkyl or halogen, is polymerized by means of solution polymerization in the presence of monomers which can be polymerized under free radical conditions, selected from vinyl monomers and acrylic monomers, during which the weight ratio of the starting polycarbonate to the monomers which can be polymerized under free radical conditions is about 70:30 to 10:90, and during which the concentration of the reaction solution does not exceed about 30% by weight, relative to the total weight of polycarbonate with unsaturated end groups, monomers which can be polymerized under free radical conditions and reaction medium.

4,310,643

VULCANIZABLE RUBBER COMPOSITION

Akio Maeda; Kinro Hashimoto, both of Yokohama; Masaaki Inagami, Kamakura, and Fukushima, Hiroshi, Zushi, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Division of Ser. No. 927,620, Jul. 24, 1978, Pat. No. 4,268,644. This application Sep. 2, 1980, Ser. No. 183,581

Claims priority, application Japan, Jul. 29, 1977, 52/91036; Jul. 29, 1977, 52/91037

Int. Cl.³ F02M *55/02*; C08L *71/02*

U.S. Cl. 525—468 **16 Claims**

1. A combination of a vulcanized rubber product with an internal combustion engine which generates sour gasoline from gasoline, said rubber product coming into contact with the sour gasoline and being formed from a vulcanizable rubber composition which comprises

(1) 100 parts by weight of a rubber selected from the group consisting of (A) a terpolymer rubber composed of 35 to 80 mole% of epichlorohydrin, 15 to 20 mole% of ethylene oxide and 5 to 15 mole% of an unsaturated epoxide, and (B) a rubber mixture prepared by mixing an epichlorohydrin-ethylene oxide copolymer rubber with an epichlorohydrin-unsaturated epoxide copolymer rubber so that the mixture will contain 35 to 80 mole% epichlorohydrin, 15 to 50 mole% of ethylene oxide and 5 to 15 mole% of an unsaturated epoxide;

(2) 0.2 to 10 parts by weight of a non-sulfur vulcanizing agent selected from the group consisting of 2-mercaptoimidazolines, 2-mercaptopyrimidines, trithiocyanuric acie and trithiocyanuric acid derivatives; and

(3) 0 to 10 parts by weight of a vulcanization aid.

14. The combination of claim 1 wherein the rubber product is a fuel system hose for said internal combustion engine.

4,310,644

VINYL ESTER RESIN COMPOSITIONS

John W. Miley, Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 14, 1980, Ser. No. 178,149

Int. Cl.³ C08L *63/10*

U.S. Cl. 525—507 **9 Claims**

1. A vinyl ester resin composition having excellent physical, mechanical and handling properties which comprises: a vinyl

ester resin made by condensing an epoxy resin and an ethylenically unsaturated monocarboxylic acid; and a thixotropy imparting amount of a thixotropy imparting material selected from at least one condensation product of a sugar alcohol and an aromatic aldehyde.

4,310,645

POLYADDUCTS OF AMMONIA AND EPOXIDE COMPOUNDS, PROCESSES FOR THEIR MODIFICATION, AND THEIR USE

Fritz E. Kempter, Mannheim; Eberhard Schupp, Schwetzingen; Hans-Uwe Schenck, Wachenheim, and Erich Gulbins, Heidelberg-Neuenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

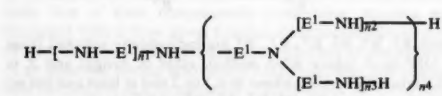
Division of Ser. No. 137,748, Apr. 7, 1980. This application Dec. 4, 1980, Ser. No. 213,174

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1979, 2914297

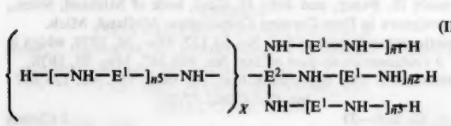
Int. Cl.[3] **C08G** *59/40*

U.S. Cl. 525—526 **4 Claims**

1. A process for modifying a polyadduct of ammonia in epoxide compounds, which consists of epoxide-free reaction products of ammonia and diepoxides, triepoxides and/or tetraepoxides, from 1.75 to 10 moles of ammonia having been employed per epoxide group and 1 mole of ammonia having been reacted with from 1.2 to 2.0 equivalents of epoxide, so that if diepoxide compounds are used products of the general formula (I)



are obtained, while if triepoxides and/or tetraepoxide compounds are used, by themselves, or together with diepoxide compounds, products of the general formula II



(II)

are produced; in these formulae, the E^1's are identical or different hydroxyl-containing divalent radicals and the E^2's are identical or different hydroxyl-containing trivalent or tetravalent radicals, resulting from the opening of the oxirane rings of epoxide compounds containing two, three or four epoxide groups in the molecule, n^1, n^3 and n^5 are from 0 to 3, n^2 and n^4 are from 1 to 3 and X is 0 or 1, and one or more of the divalent radicals E^1 in the general formula (II) may or may not be replaced by polyvalent radicals E^2, wherein the polyadduct is reacted with a monoepoxide compound, a carboxylic acid or a carboxylic acid ester.

3. A process as set forth in claim **1**, wherein from 2 to 40% by weight of a crosslinking agent from the group consisting of amine/formaldehyde condensates, phenol/formaldehyde condensates, methylol phenol ethers and blocked polyisocyanates to the modified polyadduct.

4,310,646

SELF-CROSSLINKING CATIONIC BINDERS AND THEIR PREPARATION

Fritz E. Kempter, Mannheim, and Eberhard Schupp, Schwetzingen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 7, 1980, Ser. No. 138,010

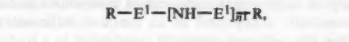
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1979, 2914331; Mar. 7, 1980, 3008810

Int. Cl.[3] **C08G** *18/80, 18/58;* **C25D** *13/06;* **C08L** *73/00*

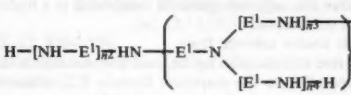
U.S. Cl. 525—528 **39 Claims**

1. A self-crosslinking binder, based on adducts of ammonia and epoxide compounds, for the cathodic electrocoating of metallically conductive articles, which binder has been obtained by reacting

(A) an adduct of ammonia and epoxide compounds of the general formulae

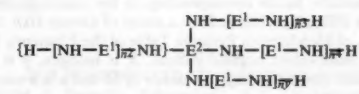


(I)



(II)

and/or



(III)

where R is S-alkyl of 1 to 12 carbon atoms, or phenoxy or alkylphenoxy where alkyl is of 1 to 18 carbon atoms, the E^1's are identical or different hydroxyl-containing divalent radicals and the E^2's are identical or different hydroxyl-containing trivalent or tetravalent radicals, resulting from the opening of the oxirane rings of epoxide compounds containing two, three or four epoxide groups in the molecule, an n^1 is from 1 to 5, n^2, n^3, n^4 and n^6 are from 0 to 3 and n^5 is from 1 to 3, with

(B) partially or completely blocked diisocyanates or polyisocyanates, with or without

(C) diamines or polyamines

and subsequently protonizing the reaction product with an acid, with the proviso that for the preparation of component (A) the epoxide compounds are reacted with ammonia in such relative proportions that there are 1.75 to 10 moles of ammonia per epoxide group and the reaction product of (A) and (B) or of (A), (B) and (C) has an amine number of from 10 to 150 mg of KOH/g of solid product.

4,310,647

HALOGENATED DICYCLOPENTADIENYL FUMARATES

George Zacharias, Alvin, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1980, Ser. No. 135,027

Int. Cl.[3] **C08L** *63/00*

U.S. Cl. 525—530 **3 Claims**

1. A curable resinous composition comprising (1) a vinyl ester resin which is the reaction product: of essentially equivalent amounts of a polyepoxide and a monoethylenically unsaturated carboxylic acid, and

(2) a reactive diluent consisting essentially of a dicyclopentadienyl monoester or diester of fumaric acid wherein said dicyclopentadienyl ester group contains one or two halogen atoms.

4,310,648
POLYMERIZATION OF OLEFINS IN THE PRESENCE OF A CATALYST CONTAINING TITANIUM AND ZIRCONIUM

Randall S. Shipley, Alvin, and Kirby Lowery, Jr., Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 20, 1980, Ser. No. 198,685
Int. Cl.³ C08F 4/76, 10/02
U.S. Cl. 526—114 **30 Claims**

1. A process for the polymerization of one or more α-olefins under conditions characteristic of Ziegler polymerization wherein the polymerization is conducted in the presence of, as a catalyst therefor, the reaction product of

(A) a trivalent or tetravalent titanium compound;

(B) a zirconium compound;

(C) an organomagnesium component selected from

(1) an organomagnesium compound or

(2) a complex of an organomagnesium compound and an organometallic compound in an amount sufficient to solubilize the organomagnesium compound in a hydrocarbon solvent and

(D) a halide source selected from

(1) an active non-metallic halide, said non-metallic halide corresponding to the empirical formula R′X where in R′ is hydrogen or an organic group at least as active as sec-butyl and X is halogen or

(2) a metallic halide corresponding to the empirical formula $MR_{y-a}X_a$ wherein M is a metal of Group IIIA or IVA of Mendeleev's Periodic Table of the Elements, R is a monovalent organic radical, X is halogen, y is a number corresponding to valence of M and a is a number from 1 to y;

provided that the proportions of the foregoing components of said catalytic reaction product being such that the atomic ratio of Mg:Zr is from about 1:1 to about 100:1; the atomic ratio of Al:Zr is from about 0.1:1 to about 100:1; the atomic ratio of Zr:Ti is from about 0.1:1 to about 50:1; the atomic ratio of excess X:Al is from about 0.0005:1 to about 10:1; and

further provided that when the organomagnesium component and/or the halide source provides insufficient quantities of aluminum, there is also present.

(E) an aluminum compound represented by the empirical formula $AlR_{y'}X_{y''}$ wherein R and X are as defined above and y′ and y″ each have a value of from zero to three with the total value of y′ plus y″ being three; and wherein the components are added in an order selected from:

(a) (i) component (C), (ii) component (D), (iii) component (E), if employed, followed by (iv) components (A) and (B) in any order or as a mixture;

(b) (i) component (D) if it contains aluminum, (ii) component (C), (iii) components (A) and (B) in any order or as a mixture; and

(c) (i) component (D) if aluminum is present, (ii) components (A) and (B) in any order or as a mixture and (iii) component (C).

4,310,649
PROCESS FOR PRODUCTION OF VINYL CHLORIDE POLYMER USING ALCOHOLS

Karen Sjolin, Sundsvall, Sweden, assignor to KemaNord AB, Stockholm, Sweden

Continuation of Ser. No. 701,715, Jul. 1, 1976, abandoned. This application Jan. 23, 1978, Ser. No. 871,896
Claims priority, application Sweden, Jan. 7, 1975, 7507570
Int. Cl.³ C08F 2/24
U.S. Cl. 526—212 **8 Claims**

1. In the known emulsion polymerization process for the preparation of vinyl chloride polymers, suitable for the production of plastisols, by heating a water dispersion of vinyl chloride and 0–20 percent of at least one other ethylenically unsaturated copolymerizable monomer in the presence of a water-soluble initiator, wherein the improvement which comprises:

(a) that said monomer or monomers are added to a pre-dispersion of said water, emulsifier and alcohol which have been prepared by mixing the components at a temperature at or above the melting point of said alcohol, and

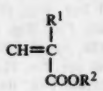
(b) that said polymerization is carried out by using a water-soluble organic initiator.

4,310,650
ULTRAVIOLET ABSORBING COPOLYMERS

Amitava Gupta, Pasadena, and Andre H. Yavrouian, La Crescenta, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Mar. 3, 1980, Ser. No. 126,580
Int. Cl.³ C08F 216/02, 216/10, 220/12
U.S. Cl. 526—313 **4 Claims**

1. An ultraviolet absorbing copolymer of an addition polymerized copolymer of a monomer mixture comprising: an acrylic ester of the formula:

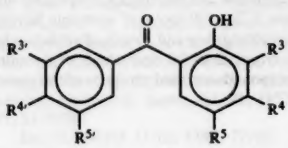


where

R^1 is hydrogen, alkyl of 1 to 6 carbon atoms and

R^2 is alkyl of 1 to 6 carbon atoms; and

0.1 to 5% of a hydroxy-benzophenone of the formula:



where R^3, R^4, R^5, $R^{3'}$, $R^{4'}$, $R^{5'}$ are individually selected from H, OR^6 or Z where R^6 is methyl, ethyl or propyl and Z is $-(CH_2)_m-CH=CH_2$ where m is 1 or 2 and at least one but no more than two of R^3, R^4, R^5, $R^{3'}$, $R^{4'}$ or $R^{5'}$ are Z.

4,310,651
METHOD FOR PREPARING SILICON CARBIDE

Ronald H. Baney, and John H. Gaul, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 24,137, Mar. 26, 1979, which is a continuation-in-part of Ser. No. 910,247, May 30, 1978, abandoned. This application Mar. 31, 1980, Ser. No. 135,567
Int. Cl.³ C08G 77/06
U.S. Cl. 528—21 **2 Claims**

1. A product which is produced by a method which consists of treating organohalogendisilanes with 0.1 to 10 percent by weight of a catalyst selected from the group consisting of quaternary ammonium halides having the formula $(R')_4NX$, quaternary phosphonium halides having the formula $(R')_4PX$ and hexamethylphosphoramide wherein R′ is a member selected from the class consisting of alkyl and aryl radicals and X is a halogen, at a temperature of from 150° C. to 340° C. for a period of 1 to 48 hours while distilling by-produced volatile materials until there is produced a chlorine containing or a bromine containing polysilane, which is a solid at 25° C., having the average formula

$$\{(CH_3)_2Si\}\{CH_3Si\}$$

in which polysilane there is from 0 to 60 mole percent $(CH_3)_2Si=$ units and 40 to 100 mole percent $CH_3Si=$ units, wherein the remaining bonds on silicon are attached to either

another silicon atom, a chlorine atom or a bromine atom such that the polysilane contains from 10–38 weight percent, based on the weight of the polysilane, of hydrolyzable chlorine or 21–58 weight percent based on the weight of the polysilane of hydrolyzable bromine.

4,310,652

MELT PROCESSABLE POLY(ESTER CARBONATE) WITH HIGH GLASS TRANSITION TEMPERATURE

Bruce T. DeBona, Madison, and Dusan C. Prevorsek, Morris Township, Morris County, both of N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Mar. 24, 1980, Ser. No. 133,228
Int. Cl.³ C08G *63/00*
U.S. Cl. 528—125 6 Claims

1. A poly(ester carbonate) consisting essentially of about equimolar amounts of moieties derived from aromatic diols and a combination of carbonate moieties and aromatic or cycloalphatic diacyl moieties, with at least about 5 mol percent of the moieties derived from aromatic diols being a bisphenoxy moiety having the 4-carbon of each of two phenoxies covalently bonded to the same ring carbon of a carbocyclic of heterocyclic moiety, said carbocyclic or heterocyclic moiety having 5 to 14 cyclic atoms in 1 to 3 rings and being inert under polymerization reaction conditions.

4,310,653

PRODUCTION OF MONOMERIC ETHERIFIED BISPHENOL-FORMALDEHYDE CONDENSATES

John J. Krajewski, Wheeling, and Edward J. Murphy, Mt. Prospect, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Oct. 8, 1980, Ser. No. 195,110
Int. Cl.³ C08G *2/34, 8/20, 8/36*
U.S. Cl. 528—143 11 Claims

1. A method of producing essentially monomeric etherified formaldehyde condensates with a bisphenol having a plurality of formaldehyde-reactive sites, said condensates being substantially free of ionic contaminants comprising, reacting said bisphenol with at least about 2 moles of formaldehyde per mole of bisphenol in solution in etherifying alcohol in the presence of an insoluble strong acid cation exchange resin, the reaction bein carried out at a temperature of from about 30° C. to about 100° C. to simultaneously provide the desired methylolation and etherification without introducing soluble ionic contaminants.

4,310,654

POLYETHERSULFONEFORMALS

James C. Carnahan, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 17, 1980, Ser. No. 141,252
Int. Cl.³ C08G *65/40*
U.S. Cl. 528—174 10 Claims

1. A method for making polyethersulfoneformals which comprises,

(A) effecting reaction between a dihalodiarylsulfone of the formula,

and from 1.0001 to 2 moles, per mole of the dihalodiarylsulfonium of a bisphenoxide salt of the formula,

MOZOM,

in the presence of a dipolar aprotic solvent, or a nonpolar solvent and an effective amount of a phase transfer catalyst to produce a bisphenoxide terminated diarylsulfone bisphenol oligomer,

(B) effecting reaction between the oligomer of (A) and an methylene halide selected from the class consisting of XCH_2X and XCF_2X to produce a polyethersulfoneformal and

(C) recovering the resulting polyethersulfoneformal from the mixture of (B),

where R is a divalent $C_{(6-13)}$ aromatic radical, Z is a divalent $C_{(6-25)}$ aromatic radical, M is an alkali metal ion and X is halogen.

4,310,655

POLYMERS OF P-(1,1-DIMETHYL-2-HYDROXYETHYL)BENZOIC ACID AND PREPARATION THEREOF

Herbert K. Reimschuessel, Morristown, and Bruce T. DeBona, Madison, both of N.J., assignors to Allied Corporation, Morristown, N.J.

Filed May 27, 1980, Ser. No. 153,361
Int. Cl.³ C08G *63/06*
U.S. Cl. 528—176 6 Claims

1. Polyester polymers of (p-1,1-dimethyl-2-hydroxyethyl)-benzoic acid.

4. A copolymer of p-(1,1-dimethyl-2-hydroxyethyl)benzoic acid and 2-hydroxyethyl terephthalate in accordance with claim 1.

4,310,656

POLYCARBONATE TRANSESTERIFICATION

Daniel J. Brunelle, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1980, Ser. No. 134,705
Int. Cl.³ C08G *63/62*
U.S. Cl. 528—200 10 Claims

1. A polycarbonate transesterification process comprising reacting mixtures of bis(ortho-haloaryl)carbonate/orthohaloaryl arylcarbonate and a dihydric phenol under transesterification reaction conditions.

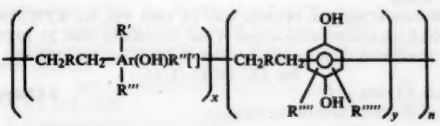
4,310,657

POLYMERIC MONOHYDROXYBENZENOID HYDROQUINOID ANTIOXIDANTS

Carl Serres, Jr., Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 25, 1979, Ser. No. 51,450
Int. Cl.³ C08G *61/02*; C07D *333/76, 333/72, 333/56, 39/14, 39/12, 39/08*
U.S. Cl. 528—212 10 Claims

1. A monohydroxybenzenoid hydroquinoid polymer of the formula



wherein R is a benzenoid ring group selected from the group consisting of benzene, naphthalene, biphenyl, diphenylmethane, thiophene, benzothiophene and dibenzothiophene moieties, wherein Ar is a benzenoid ring group selected from the group consisting of phenyl, naphthyl, anthranyl and phenanthranyl groups, and wherein R' is an alkyl group of 9 to 18 carbon atoms, and R'', R''', R'''' and R''''' are independently selected from a group consisting of hydrogen, alkyls of one to 26 carbon atoms and aralkyls of from 7 to 26 carbon atoms, x and y are of the ratio of from 1:1 to 1:3 and n is an integer of from one to 20.

4,310,658

PRODUCTION OF POLYESTER THERMALLY STABILIZED WITH AN OXIRANE

Stanley D. Lazarus, Petersburg, Va.; Robert S. Cooke, Morris Plains, and Paul E. Galick, Budd Lake, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 18, 1980, Ser. No. 160,418
Int. Cl.[3] C08G *63/76*
U.S. Cl. 528—309 12 Claims

1. A thermally stabilized high molecular weight linear terephthalate condensation polyester having incorporated therein a thermally stabilizing amount of a stabilizer consisting of 2-(phenoxy methyl)-3-phenyl oxirane, said thermally stabilized polyester having a free carboxyl concentration of less than 15 gram equivalents of carboxyl groups per 10^6 grams of polyester.

4,310,659

TWO-STAGE HYDROLYSIS PROCESS FOR THE PREPARATION OF NYLON 6

Samuel L. Yates; Charles J. Cole; Albert H. Wiesner, all of Columbia, S.C., and John W. Wagner, Petersburg, Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 21, 1980, Ser. No. 141,827
Int. Cl.[3] C08G *69/16*
U.S. Cl. 528—323 10 Claims

1. In a process for the production of polycaproamide shaped articles from molten anhydrous nascent polymer comprising

continuously hydrolyzing epsilon-caprolactam to form a prepolymer, then continuously removing most of the water extractables and completing the polymerization reaction by polycondensation, then

continuously extruding said polymer melt, and finally

cooling said extruded polymer to form uniformly shaped articles,

the improvement comprising carrying out the continuous hydrolyzation in two stages,

a first stage at a temperature of about 180° C. to 260° C., a pressure of about 20 to 150 psig. for a period of about 0.5 to 4 hours, then before an equilibrium conversion condition is reached, a second stage at a temperature of about 200° C. to 260° C., a pressure of about 100 to 900 Torr for a period of about 2 to 15 hours, while continuously removing most of the water and some water extractables, so that water and water extractables are removed both during hydrolyzation and during polycondensation, whereby the cyclic dimer content of the shaped polymer article is below 0.2 percent by weight.

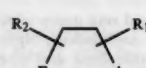
4,310,660

LINCOMYCIN COMPOUNDS

Robert D. Birkenmeyer, Comstock Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 148,056, May 19, 1980, Pat. No. 4,278,789, which is a continuation-in-part of Ser. No. 96,652, Nov. 23, 1979, abandoned. This application Oct. 6, 1980, Ser. No. 194,634
Int. Cl.[3] C07H *15/16*
U.S. Cl. 536—11 3 Claims

1. A compound of the formula



wherein A, B and E are selected from the group consisting of nitrogen, oxygen, sulfur and CR_1R_1; wherein R_1 is selected from the group consisting of hydrogen, alkyl and substituted alkyl wherein the alkyl portion is from 1 to 8 carbon atoms, inclusive, and isomeric forms thereof, cycloalkyl and substituted cycloalkyl, substituted oxygen, substituted nitrogen, halogen, phenyl, and substituted phenyl, $-(CH_2)_n-OH$, $-(CH_2)_n-NR_4R_5$, and isomeric forms thereof, wherein n is an integer of from 1 to 8, inclusive, R_4 and R_5 are H or alkyl of from 1 to 8 carbon atoms, inclusive, and isomeric forms thereof; wherein R_2 is

and X is the amino function of a compound selected from the group 7(R)-hydroxy-methyl 1-thio-α-lincosaminide, 7(S)-hydroxy-methyl 1-thio-α-lincosaminide, 7(S)-halo-methyl 1-thio-α-lincosaminide, 7(R)-halo-methyl 1-thio-α-lincosaminide, 7(S)-methoxy-methyl 1-thio-α-lincosaminide, 7-deoxy-7(S)-(methylthio)-methyl 1-thio-α-lincosaminide, 7-deoxy-7(S)-(2-hydroxyethylthio)-methyl 1-thio-α-lincosaminide and 7-deoxy-7(S)-(3-hydroxypropylthio)-methyl 1-thio-α-lincosaminide; R_1 and R_2 can be attached to any ring carbon or nitrogen atom; R_1 can be multiply attached to any ring carbon atom, and the pharmaceutically acceptable acid addition salts thereof.

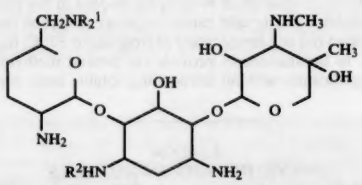
4,310,661

ANTIBIOTICS XK-62-3 AND XK-62-4 AND PROCESS FOR PRODUCTION THEREOF

Takao Iida, Tokyo; Kunikatsu Shirahata, Machida; Shinzo Ishii, Shizuoka; Ryo Okachi, Machida, and Takashi Nara, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 906,333, May 16, 1978. This application Dec. 23, 1980, Ser. No. 219,586
Claims priority, application Japan, May 19, 1977, 52-57827; Jul. 13, 1977, 52-83038
Int. Cl.[3] C07H *15/22;* A61K *31/71*
U.S. Cl. 536—17 R 3 Claims

1. A composition of matter having antibacterial activity and having the general structural formula:



wherein R^1 is H when R^2 is CH_3 and R^1 is CH_3 when R^2 is H and the pharmaceutically acceptable non-toxic acid addition salts thereof.

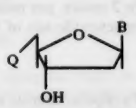
4,310,662

NUCLEOSIDIC PHOSPHORYLATING AGENT AND METHODS

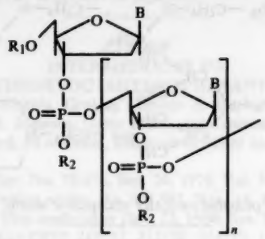
Roberto Crea, Burlingame, Calif., assignor to Genentech, Inc., San Francisco, Calif.

Filed Dec. 26, 1979, Ser. No. 107,055
Int. Cl.[3] C07H *19/10, 19/16, 21/00*
U.S. Cl. 536—27 11 Claims

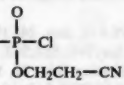
1. A method of phosphorylating a moiety of structure



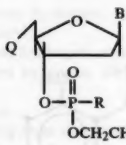
wherein B is adenyl, thymyl, guanyl or cytosyl and Q is selected from the group consisting of R_1O-, and



wherein n is zero or an integer from 1 to about 18, R_1 is an organic group labile in acidic medium and R_2 is an organic group labile in basic medium which comprises reacting said moiety with a phosphorylating reagent of structure



wherein R is a base labile phenyloxy protecting group, in the presence of a weak base to form the product



4,310,663

CONTINUOUS PROCESS FOR PRODUCING WATER-SOLUBLE HYDROXYALKYL CELLULOSE AND RELATED ETHERS

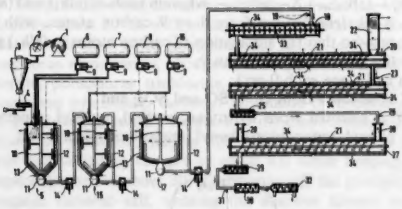
Josef Hilbig, Taunusstein; Arno Holst, Wiesbaden; Hans Künkler, Wiesbaden; Klaus Stölting, Wiesbaden, and Wolfgang Schminke, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 4, 1980, Ser. No. 156,404

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1979, 2924330

Int. Cl.³ C08G *59/68;* C08B *11/08*

U.S. Cl. 536—91 **15 Claims**



1. A continuous process for the manufacture of water-soluble hydroxyalkyl cellulose, and water-soluble mixed ethers based on hydroxyalkyl cellulose, comprising the steps of:

producing an initial slurry comprising 1 part by weight of cellulose, about 0.02 to 0.6 parts by weight of an alkali metal hydroxide, about 5 to 10 parts by weight of an inert organic solvent, and about 0.4 to 2.5 parts by weight of water;

continuously feeding said initial slurry into a first apparatus suitable for operation at elevated pressure, and mixing said initial slurry therein with at least one hydroxyalkyl etherifying agent which is gaseous at atmospheric pressure and at room temperature, and which has been liquefied under pressure;

maintaining said slurry in said first apparatus at a temperature of up to about 40° C., and under a gauge pressure of up to about 3 bars, for a residence time of from about 15 to 90 minutes, to give a degree of substitution in the range of from about 0.2 to about 1.0;

continuously circulating said slurry in said first apparatus in a loop through a homogenizing device, to form a homogenized slurry;

continuously feeding said homogenized slurry through a tubular reactor having a conveying device, an inlet, a first part, and a second part, and reacting said homogenized slurry in said reactor for a residence time of about 70 to 180 minutes at a temperature of from about 30° C. to 120° C., under a gauge pressure of up to about 10 bars; and

continuously transferring the reacted slurry from said reactor into a cooling device.

4,310,664

PROCESS FOR THE PREPARATION OF PYRIDINE-4-ALDEHYDE PHENYLHYDRAZONES

Heinz Giesecke, Leverkusen, and Alfred Brack, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 26, 1980, Ser. No. 163,362

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1979, 2928746

Int. Cl.³ C07D *213/53;* C09B *55/00*

U.S. Cl. 542—417 **5 Claims**

1. A process for the preparation of a pyridine-4-aldehyde phenylhydrazone which can be substituted on the phenyl nucleus by a non-ionic substituent selected from the group consisting of lower alkyl, lower alkoxy and halogen, which comprises catalytically hydrogenating 4-cyano-pyridine in an aqueous medium at a pH between 9 and 12 in the presence of a phenylhydrazine corresponding to the end-product hydrazone at a temperature of 0° to 60° C. and under normal pressure.

4,310,665

NOVEL STILBENE COMPOUNDS AND PROCESS FOR THE MANUFACTURE THEREOF

Rüdiger Erckel, Eppstein, and Günter Rösch, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

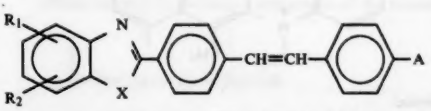
Continuation of Ser. No. 36,688, May 7, 1979, abandoned. This application Sep. 26, 1980, Ser. No. 191,000

Claims priority, application Fed. Rep. of Germany, May 10, 1978, 2820322

Int. Cl.³ C07D *405/14, 409/14, 413/14*

U.S. Cl. 542—435 **4 Claims**

1. Compounds of the formula I

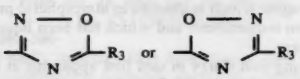


(I)

in which X is O or S; R_1 and R_2 are identical or different and each is selected from the group consisting of hydrogen, fluoro, chloro, phenyl, lower alkyl, lower alkoxy, lower dialkylamino, lower trialkylammonium, acylamino, cyano, carboxylic acid

ester, carboxylic acid amide, monoalkylcarbonamide, dialkylcarbonamide, sulfonic acid ester, monoalkylsulfonamide and dialkylsulfonamide; or R_1 and R_2 conjointly are a phenylene, a lower alkylene or a 1,3-dioxapropylene;

and A is a group of the formulae



in which R_3 is an alpha-, beta- or gamma-pyridyl, pyridylmethylene, thiophenyl, furanyl, benzofuranyl, pyrazinyl, pyrimidinyl or pyridazinyl group.

4,310,666

ANTI-NEOPLASTIC 1,4-BIS-(SUBSTITUTED AMINOALKYL AMINO)-ANTHRAQUINONES

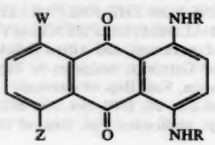
Robert K. Zee-Cheng, Overland Park, and Chia-Chung Cheng, Leawood, both of Kans., assignors to United States of America, Washington, D.C.

Division of Ser. No. 895,082, Apr. 10, 1978. This application Jun. 19, 1979, Ser. No. 50,100

Int. Cl.³ C07D *241/04*; C07C *97/12, 97/24, 97/26*

U.S. Cl. 544—380 **5 Claims**

1. A substituted anthracenedione having the formula



wherein R is $—(CH_2)_2NHR^1$ and W and Z are each selected from the group consisting of H and OH, and when W and Z are both H, R^1 is selected from the group consisting of $—CH_2CH_2CH_3$ and $—CH_2CH_2CH_2CH_3$ and when W and Z are both OH, R^1 is $—CH_2OH$.

4,310,667

2-N QUATERNARY AMMONIUM SALT DERIVATIVES OF 9-HYDROXY ELLIPTICINE

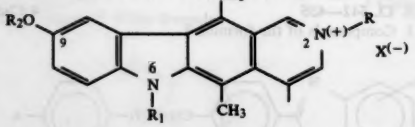
Jean-Bernard Le Pecq, and Claude Paoletti, both of Paris, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 679,357, Apr. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 518,875, Oct. 29, 1974, Pat. No. 4,045,565. This application Sep. 15, 1978, Ser. No. 942,793

Int. Cl.³ C07D *471/02*; A61K *31/475*

U.S. Cl. 546—70 **16 Claims**

1. A pharmaceutically acceptable water soluble 2-N quaternary salt of a compound of the formula

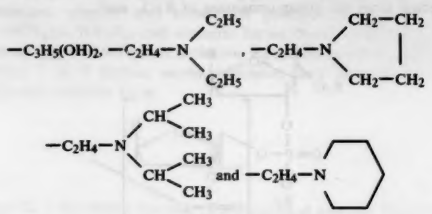


wherein:

R_1 is selected from —H, $—CH_3$ and $—C_2H_5$,

R_2 is selected from —H, $—CH_3$, $—C_2H_5$, $C_6H_5CH_2—$, $CH_3CO—$ and $C_6H_5CO—$,

R is selected from $—CH_3$, $—C_2H_5$, $—C_2H_4OH$, $—C_3H_6OH$,



and $X^{(-)}$ is a pharmaceutically acceptable anion.

4,310,668

INTERMEDIATES TO 1,9-DIHYDROXYOCTAHYDROPHENANTHRENES

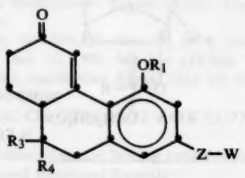
Thomas H. Althuis, Groton; Charles A. Harbert, Waterford; Michael R. Johnson, Gales Ferry, and Lawrence S. Melvin, Jr., Ledyard, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 78,475, Sep. 24, 1979, Pat. No. 4,268,692, which is a division of Ser. No. 851,503, Nov. 14, 1977, Pat. No. 4,188,495. This application Dec. 22, 1980, Ser. No. 218,966

Int. Cl.³ C07D *213/50, 213/55*

U.S. Cl. 546—204 **9 Claims**

1. A compound selected from the group consisting of those having the formula



wherein R_1 is hydrogen, benzyl, benzoyl, alkanoyl of 1 to 5 carbon atoms or $—CO—(CH_2)_p—NR'R''$ wherein p is 0 or an integer from 1 to 4; each of R′ and R″ when taken individually is hydrogen or alkyl of 1 to 4 carbon atoms; R′ and R″ when taken together with the nitrogen to which they are attached form a 5- or 6- membered heterocyclic ring selected from piperidino, pyrrolo, pyrrolidino, morpholino and N-alkylpiperazino having from 1 to 4 carbon atoms in the alkyl group;

R_3 is selected from hydrogen, methyl and ethyl;

R_4 is selected from hydrogen, alkyl of 1 to 6 carbon atoms and benzyl;

Z is selected from:

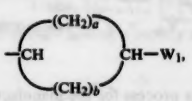
(a) alkylene having from one to nine carbon atoms;

(b) $—(alk_1)_m—X—(alk_2)_n—$wherein each of (alk_1) and (alk_2) is alkylene having from 1 to 9 carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than 9;

m and n are each 0 or 1;

X is selected from O, S, SO and SO_2; and

W is selected from hydrogen, methyl, pyridyl, piperidyl, phenyl, monochlorophenyl, monofluorophenyl and



wherein W_1 is selected from hydrogen, phenyl, monochlorophenyl and monofluorophenyl; a is an integer from 1 to 5 and b is 0 or an integer from 1 to 4, with the proviso

that the sum of a and b is not greater than 5; with the proviso that when R_1 is hydrogen, benzyl, benzoyl or said alkanoyl, W is pyridyl or piperidyl.

4,310,669
INTERMEDIATES TO 1,9-DIHYDROXYOCTAHYDROPHENANTHRENES

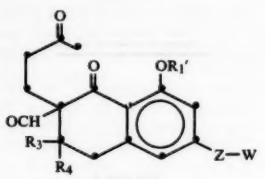
Thomas H. Althuis, Groton; Charles A. Harbert, Waterford; Michael R. Johnson, Gales Ferry, and Lawrence S. Melvin, Jr., Ledyard, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 78,474, Sep. 24, 1979, Pat. No. 4,270,005, which is a division of Ser. No. 851,503, Nov. 14, 1977, Pat. No. 4,188,495. This application Dec. 22, 1980, Ser. No. 219,319

Int. Cl.³ C07D *213/55, 213/50, 211/32, 211/34*

U.S. Cl. 546—206 **9 Claims**

1. A compound of the formula



wherein

R'_1 is selected from hydrogen, alkanoyl of 1 to 6 carbon atoms and benzoyl;

R_3 is selected from hydrogen, methyl and ethyl;

R_4 is selected from hydrogen, alkyl of 1 to 6 carbon atoms and benzoyl;

Z is selected from:

(a) alkylene having from one to nine carbon atoms;

(b)-$(alk_1)_m$-X-$(alk_2)_n$- wherein each of (alk_1) and (alk_2) is alkylene having from 1 to 9 carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than 9;

m and n are each 0 or 1;

X is selected from O, S, SO and SO_2; and

W is selected from pyridyl and piperidyl.

4,310,670
LOW-TEMPERATURE, AQUEOUS CONVERSION OF 4-PICOLINE DERIVATIVE TO 5-CYANO-[3,4'-BIPYRIDIN]-6(1H)-ONE

Karl O. Gelotte, Nassau, and Edward D. Parady, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Feb. 26, 1980, Ser. No. 124,807

Int. Cl.³ C07D *213/22, 213/54*

U.S. Cl. 546—257 **6 Claims**

1. The process which comprises the steps of reacting 4-picoline below about 30° C. with at least three mole equivalents per mole of 4-picoline of an inorganic acid halide selected from phosphorus oxychloride, phosgene, thionyl chloride, sulfuryl chloride, phosphorus trichloride, phosphorus pentachloride, phosphorus tribromide, carbonyl dibromide or thiophosgene and about five to twenty volumes of dimethylformamide per volume of 4-picoline, adding the reaction mixture to cold water and adjusting the pH to about 8.0 while keeping the temperature below about 30° C., filtering off the precipitated inorganic cationic salt, treating the aqueous filtrate which contains N-[3-dimethylamino-2-(4-pyridinyl)-2-propenylidene]-N-methylmethaniminium salt with at least about 30–35% molar excess of α-cyanoacetamide and at least three mole equivalents of base still keeping the temperature below about 30° C., and then isolating either 5-cyano-[3,4'-bipyridin]-6(1H)-one as its inorganic cationic salt or, after neutralization, in its free base form.

4,310,671
PROCESS FOR PRODUCING 2,6-DICHLORO-3-NITROPYRIDINE

Max M. Boudakian, Pittsford, N.Y., assignor to Olin Corporation, New Haven, Conn.

Filed Aug. 21, 1978, Ser. No. 935,210

Int. Cl.³ C07D *213/26*

U.S. Cl. 546—304 **10 Claims**

1. A process for producing 2,6-dichloro-3-nitropyridine comprising:

reacting 2,6-dichloropyridine with nitric acid in the presence of about 10–65% strength by weight oleum to produce a reaction mixture comprising 2,6-dichloro-3-nitropyridine.

4,310,672
SYNTHESIS OF INTERMEDIATES FOR TETRAMISOLE, LEVAMISOLE AND THEIR DERIVATIVES

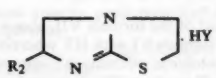
Sivaraman Raghu, Norwalk; Arthur K. Hoffmann, New Canaan, and Balwant Singh, Stamford, all of Conn., assignors to American Cyanamid Co., Stamford, Conn.

Continuation of Ser. No. 958,237, Nov. 6, 1978, abandoned, which is a division of Ser. No. 884,674, Mar. 8, 1978, Pat. No. 4,139,707, which is a division of Ser. No. 739,924, Nov. 8, 1976, Pat. No. 4,090,025, which is a continuation-in-part of Ser. No. 680,311, Apr. 26, 1976, abandoned. This application Mar. 17, 1980, Ser. No. 131,293

Int. Cl.³ C07D *277/60*

U.S. Cl. 548—155 **2 Claims**

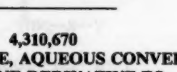
1. A method for the preparation of a compound of the formula:



(VII)

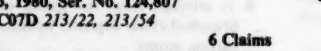
which comprises

reacting an alpha-substituted ketone of the formula:



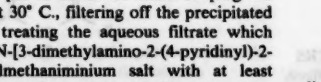
(I)

wherein R_2 is phenyl or phenyl substituted with up to two groups of lower alkyl, lower alkoxy, halo or trifluoromethyl and X is halogen or p-toluene sulfonate with an amine of the formula:



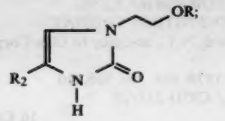
(II)

or its acid addition salts wherein R is hydrogen, C_1–C_6 alkyl, halo C_1–C_6 alkyl, phenyl optionally substituted with up to three groups of lower alkyl, halogen or lower alkoxy, or the formula COR_3 wherein R_3 is hydrogen, C_1–C_6 alkyl, halo C_1–C_6 alkyl, phenyl or phenyl substituted with up to four groups of lower alkyl, halogen, lower alkoxy or trifluoromethyl to produce a compound of the formula:

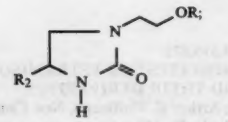


(III)

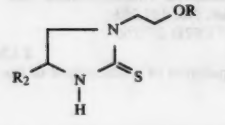
dissolving compound III in an organic solvent of methylene chloride, chloroform, either, methanol or ethanol heated from about 0° to about 100° C. in the presence of cyanic acid and a hydronium ion source to yield a compound of the formula:


(IV)

hydrogenating the compound of formula IV at about 15 to about 1000 psig of hydrogen is a solvent of alcohol, hydrocarbon, mixed alcohol-hydrocarbon solvent or acetic acid in the presence of a palladium or platinum catalyst at a temperature from about 0° to about 100° C. for about 30 minutes to 4 hours to yield an imidazolidone of the formula:


(V)

heating the imidazolidone of formula V in an inert solvent at a temperature from about 80° to about 200° C. in the presence of a reagent of phosphorous pentasulfide for oxygen to yield an imidazolidinethione of the formula:


(VI)

and some of a compound of the formula VII, above; and heating the compound of formula VI with HY wherein Y is a halogen, bisulfate or p-toluene sulfonate in a solvent at a temperature from about 0° to about 200° C. to produce the compound of formula VII.

4,310,673

XANTHENE COMPOUNDS

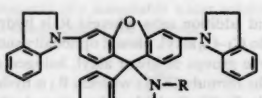
James W. Foley, Andover; Louis Locatell, Jr., Wellesley Hills, and Charles M. Zepp, Boylston, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 106,905, Dec. 26, 1979, Pat. No. 4,258,118. This application Oct. 6, 1980, Ser. No. 194,464

Int. Cl.³ C07D *275/04*

U.S. Cl. 548—207 **3 Claims**

1. A compound of the formula



wherein R is hydrogen or alkyl.

4,310,674

OXAZOLIDINE PROPIONIC ACID METHYL ESTERS

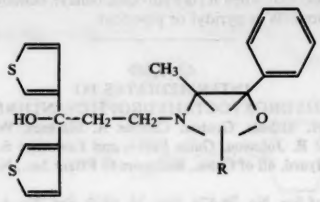
Frank J. Stiefel, Princeton, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Filed Jul. 18, 1980, Ser. No. 170,027

Int. Cl.³ C07D *263/04*; A61K *31/42*

U.S. Cl. 548—215 **6 Claims**

1. Compounds of the formula



wherein R is hydrogen or lower alkyl.

4,310,675

MONORADIOIODINATED IMIDAZOLE DERIVATIVES

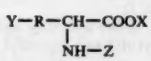
Anandrao S. Akerkar, Pomona, N.Y., and Herman Rutner, Hackensack, N.J., assignors to Becton Dickinson & Company, Paramus, N.J.

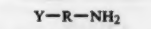
Division of Ser. No. 885,447, Mar. 10, 1978, Pat. No. 4,202,874, which is a division of Ser. No. 727,407, Sep. 29, 1976, Pat. No. 4,120,867. This application May 24, 1979, Ser. No. 42,009

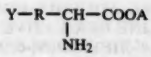
Int. Cl.³ C07D *403/12, 233/64, 233/95*

U.S. Cl. 548—336 **11 Claims**

1. A compound selected from the group consisting of:


(a)


(b)


(c)

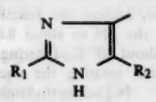
wherein

R is selected from the group consisting of straight and branched chain aliphatic hydrocarbons having from 1 to 6 carbon atoms;

X is selected from the group consisting of hydrogen and active esters for coupling the compound to an amino group;

Z is benzyloxycarbonyl;

Y is



wherein one of R_1 and R_2 is a radioisotope of iodine and the other of R_1 and R_2 is selected from the group consisting of lower alkoxy, fluoro-, chloro-, bromo-, and nitro-;

A is selected from the group consisting of hydrogen, lower alkyl, an alkali metal and an alkaline earth metal.

4,310,676

METHOD OF STABILIZING MONOMERIC ACRYLIC ACID ESTERS AGAINST PREMATURE POLYMERIZATION AND ESTERS THUS STABILIZED

Wilhelm K. Schropp, Weinheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 2, 1980, Ser. No. 164,527

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1979, 2931553

Int. Cl.³ C07C 67/62

U.S. Cl. 560—4 3 Claims

1. A process for stabilizing monomeric esters of acrylic acid with alkanols of 1 to 8 carbon atoms against premature polymerization, which comprises admixing with said monomeric ester phenothiazine and para-nitrosophenol.

4,310,677

PREPARATION OF ALKYL ANTHRANILATES

Gernot Reissenweber, Ludwigshafen, and Dietrich Mangold, Neckargemuend, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

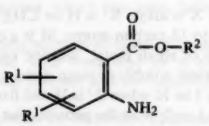
Filed Dec. 17, 1980, Ser. No. 217,453

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1980, 3001579

Int. Cl.³ C07C 79/46, 101/54

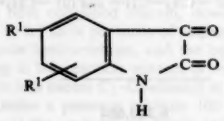
U.S. Cl. 560—22 8 Claims

1. A process for the preparation of alkyl anthranilates of the formula



I

where the R^1's may be identical or different and each is hydrogen, halogen, an aliphatic radical, $—OR^3$ (where R^3 is an aliphatic radical) or nitro, and R^2 is an aliphatic radical, wherein an isatin of the formula



II

where R^1 has the above meanings, is reacted with an alkanol of the formula

$$R^2OH \qquad \text{III}$$

where R^2 has the above meaning, and hydrogen peroxide in the presence of an alkali metal alkanolate of the formula

$$ZOR^2 \qquad \text{IV}$$

where Z is an alkali metal atom and R^2 has the above meaning.

4,310,678

LIQUID COPOLYMERIC ORGANOPOLYSILOXANES COMPRISING SiO_2 AND METHOD THEREFOR

John D. Blizzard, Bay City, and Terence J. Swihart, Essexville, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 2, 1980, Ser. No. 212,188

Int. Cl.³ C07F 7/08

U.S. Cl. 556—451 12 Claims

1. A method for preparing a liquid copolymeric organopolysiloxane, said method comprising

(A) forming a homogeneous mixture having an acid number greater than zero and comprising

(a) an organic solvent solution of a resinous copolymeric siloxane containing silicon-bonded hydroxyl radicals and consisting essentially of $R_3SiO_{1/2}$ siloxane units and $SiO_{4/2}$ siloxane units wherein the ratio of the number of said $R_3SiO_{1/2}$ siloxane units to the number of said $SiO_{4/2}$ siloxane units has a value of from 0.6/1 to 0.9/1 and each R denotes, independently, a monovalent hydrocarbon radical and

(b) a liquid organohydrogenpolysiloxane wherein each organic radical is, independently, a monovalent hydrocarbon radical, there being an average of at least one silicon-bonded hydrogen radical per molecule of said organohydrogenpolysiloxane, and

(B) heating said homogeneous mixture to remove substantially all of said organic solvent therefrom.

4,310,679

EQUILIBRATING ORGANOSILOXANES WITH FLUORINE- AND SULPHONYL-CONTAINING CATALYSTS

Ulrich Finke, Ettlingen, and Hans-Heinrich Moretto, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 3, 1980, Ser. No. 212,392

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951801

Int. Cl.³ C07F 7/08

U.S. Cl. 556—462 2 Claims

1. In the preparation of equilibration products of organosiloxanes by contacting at least one organosiloxane with a cation exchange resin, the improvement which comprises employing as said resin a polymer having side chains carrying sulphonyl groups, the carbon atoms carrying the sulphonyl groups also carrying at least one fluorine atom.

4,310,680

METHOD OF CLEAVING SILOXANES

Hans-Joachim Kötzsch, Rheinfelden; Jürgen Amort, Troisdorf, and Hans-Joachim Vahlensieck, Wehr, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

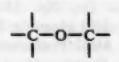
Filed Dec. 11, 1980, Ser. No. 215,488

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950030

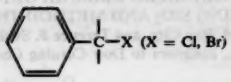
Int. Cl.³ C07F 7/08, 7/18

U.S. Cl. 556—467 29 Claims

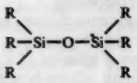
1. A process for the preparation of a halogen silane and an aromatic compound having at least one —C═O— or



group, while simultaneously effecting cleavage of a siloxane which comprises contacting a compound having at least one aromatically bound mono and/or dihalogen methylene group or an aromatic compound having a mono-, di and/or trihalogen methyl group of the formula



wherein the aromatic moiety can be optionally otherwise substituted, with a siloxane of the formula



wherein each R moiety is independently selected from the group consisting of halogen, alkyl, alkenyl and O—SiR_3, wherein such R moiety is halogen, alkyl or alkenyl, wherein at least two of the R moieties can, together with the silicon atom to which they are attached, form a ring, at an elevated temperature in the presence of a catalytic amount of a metal or a metal compound, which metal is of the sub-group of elements or of the 5th principal group of the periodic system of the elements, together with a proton donor, or in the presence of a catalytic amount of an oxygen acid.

4,310,681

CARBOALKOXY ALKYL NORBORNANE DERIVATIVES AND PROCESS FOR PREPARING SAME

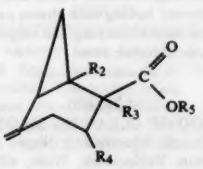
Philip T. Klemarczyk, Old Bridge; James M. Sanders, Eatontown; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank; Frederick L. Schmitt, Holmdel, and Edward J. Granda, Englishtown, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 133,870, Mar. 25, 1980. This application May 22, 1980, Ser. No. 152,201

Int. Cl.³ C07C *67/30, 69/753*

U.S. Cl. 560—120 **3 Claims**

1. At least one compound defined according to the structure:



wherein R_2 is hydrogen and R_3 and R_4 represent hydrogen or methyl; and wherein R_5 is C_1–C_4 lower alkyl.

4,310,682

HALO-SALICYLANILIDE

Isao Ozawa, No. 255-31, Takahata, Fujishima, Komaki, Aichi Prefecture; Tomiyoshi Ito, No. 35-9-1, Hara-cho, Suita, Osaka Prefecture; Yoshiki Hamada, No. 5-5-3, Wagogaoka, Togo-cho, Aichi-gun, Aichi Prefecture, and Isao Takeuchi, No. 15-5-2, Asahidai, Owariasahi, Aichi Prefecture, all of Japan

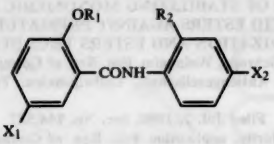
Filed Feb. 22, 1980, Ser. No. 123,655

Claims priority, application Japan, Feb. 28, 1979, 54-23800

Int. Cl.³ C07C *103/76*

U.S. Cl. 560—142 **6 Claims**

1. A halo-salicylanilide of the following formula



wherein R_1 represents hydrogen or an acyl group, R_2 represents an alkyl group, X_1 represents fluorine, chlorine, or iodine, and X_2 represents fluorine, chlorine, bromine or iodine when X_1 is fluorine or iodine, X_2 represents fluorine, bromine or iodine when X_1 is chlorine and R_1 is hydrogen, and X_2 represents fluorine, chlorine, bromine or iodine when X_1 is chlorine and R_1 is an acyl group.

4,310,683

SULFOSUCCINATE DIESTERS

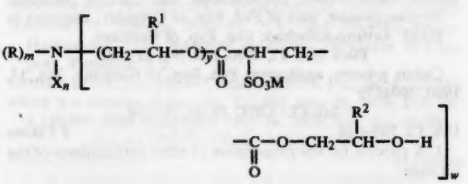
Kermit D. Longley, Park Forest, and Anastasios J. Karalis, Chicago, both of Ill., assignors to Witco Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 842,198, Oct. 14, 1977, abandoned, which is a continuation of Ser. No. 575,324, May 7, 1975, abandoned. This application Jun. 15, 1979, Ser. No. 48,924

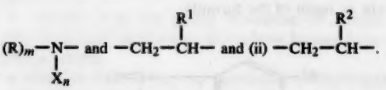
Int. Cl.³ C07C *143/12*

U.S. Cl. 560—151 **7 Claims**

1. A sulfosuccinate surfactant according to the formula



where R is alkyl; X is alkyl; R^1 is H or CH_3; R^2 is an alkyl having from 1 to 18 carbon atoms; M is a cation selected from the group of alkali metal, alkaline earth metal, ammonium, and water soluble organic amines; m is 1 or 2; n is zero or 1; y is 1 to 10 when R^1 is H and from 1 to 3 when R^1 is CH_3; w is 1 or 2; with the proviso that the number of carbon atoms in $(R)_m$ is from 2 to 24, and that there is a difference of at least 2 in the number of carbon atoms between the sum of the carbon atoms in (i)



and (ii) $-CH_2-CH(R^2)-$.

4,310,684

PROCESS FOR SEPARATING POLY-β-HYDROXYBUTYRATES FROM A BIOMASS

Noël Vanlautem, Wavre, and Jacques Gilain, Brussels, both of Belgium, assignors to Solvay & Cie., Brussels, Belgium

Filed Jan. 4, 1980, Ser. No. 109,537

Claims priority, application France, Jan. 22, 1979, 79 01862

Int. Cl.³ C07C *69/675, 67/56*

U.S. Cl. 560—185 **6 Claims**

1. Process for separating poly-β-hydroxybutyrates from a biomass by extraction using liquid halogenated solvents, comprising performing the extraction with at least one liquid halogenated solvet selected from the group consisting of 1,2-

dichloroethane, 1,1,2-trichloroethane, and 1,1,2,2-tetrachloroethane.

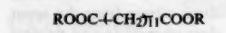
4,310,685

PROCESS FOR PREPARING BRASSYLIC DIESTER

Kiyohito Sawano, Hiratsuka; Toyohiko Kobayashi, and Haruki Tsuruta, both of Yokohama, all of Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1980, Ser. No. 123,246
Claims priority, application Japan, Feb. 26, 1979, 54-21575
Int. Cl.³ C07C 67/42
U.S. Cl. 560—204 7 Claims

1. A process for preparing a brassylic diester of the formula:



wherein R is a lower alkyl group which comprises hydrocracking 6,6'-methylenebis-(6-hexanolide) in an alcohol of the formula:

wherein R is as defined above, in the presence of a metal catalyst and an acid catalyst.

4,310,686

PREPARATION OF BUTANEDICARBOXYLIC ESTERS

Rudolf Kummer, Frankenthal; Heinz-Walter Schneider; Volker Taglieber, both of Ludwigshafen, and Franz-Josef Weiss, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 27, 1980, Ser. No. 153,572
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1979, 2924785
Int. Cl.³ C07C 67/38
U.S. Cl. 560—204 6 Claims

1. A process for the preparation of butanedicarboxylic acid esters, wherein

(a) an aqueous cobalt salt solution is treated, at from 50° to 200° C. and under a pressure of from 50 to 500 bar, with excess carbon monoxide and hydrogen in the presence of active charcoal which has been laden with cobalt carbonyl,

(b) the resulting aqueous solution of cobalt carbonyl hydride is extracted with butadiene or a butadiene-containing hydrocarbon mixture and the aqueous phase is separated off,

(c) the butadiene, or butadiene/hydrocarbon mixture, containing cobalt carbonyl hydride, cobalt carbonyl and butenyl-cobalt tricarbonyl, is reacted with carbon monoxide and excess C_1–C_4-alkanol in the presence of from 0.5 to 2 moles, per mole of butadiene, of a tertiary nitrogen base having a pK_a of from 3 to 11, at from 80° to 150° C. under a pressure of from 300 to 2,000 bar,

(d) the resulting reaction mixture is freed from the tertiary nitrogen base contained therein, down to a content of from 0.1 to 0.3 mole per mole of pentenoic acid ester, and from excess hydrocarbons, and the pentenoic acid ester remaining in the reaction mixture is reacted with carbon monoxide and excess C_1–C_4-alkanol at from 140° to 200° C. and under a pressure of from 100 to 400 bar in the presence of the amounts of cobalt carbonyl and tertiary nitrogen base contained in the reaction mixture,

(e) the reaction mixture containing cobalt catalyst, butanedicarboxylic acid esters, alkanols, tertiary nitrogen base, pentenoic acid esters and by-products is treated with an oxidizing agent in the presence of the aqueous acid solution which has been separated off in stage (b), and the mixture is separated into an organic phase, from which butanedicarboxylic acid esters are isolated by distillation, and an aqueous phase, and (f) the aqueous phase is extracted with C_1–C_4-alkyl esters of C_1–C_5-alkanecarboxylic acids or C_1–C_4-alkyl esters of C_4–C_5-alkenecarboxylic acids or mixtures of said alkyl esters of alkanecarboxylic acids and alkyl esters of alkenecarboxylic acids, the phases are separated, and the aqueous phase thus obtained is freed from alkanols and tertiary nitrogen base by distilling these off and is recycled to stage (a).

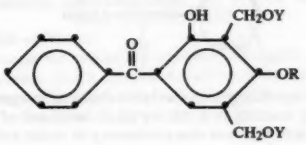
4,310,687

COPOLYMERIZABLE ULTRAVIOLET LIGHT ABSORBER MONOMERS WHICH ARE ACRYLATE ESTERS OF 2-HYDROXY, ALKOXY, METHYLOL BENZOPHENONES

Eugene S. Barabas, Watchung; Prakash Mallya, Bloomingdale, and Stanley J. Gromelski, Jr., W. Caldwell, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jul. 10, 1980, Ser. No. 168,223
Int. Cl.³ C07C 69/54
U.S. Cl. 560—221 1 Claim

1. A copolymerizable ultraviolet light monomer which is an acrylate ester of 2-hydroxy, alkoxy, methylolbenzophenone having the formula:



where R is alkyl C_1–C_8 and Y is a copolymerizable radical selected from acryloyl and alkylacryloyl, where said monomers are obtained by a reaction comprising the treatment of 2-hydroxy-4-alkoxybenzophenone with an excess of formaldehyde in a ratio of at least 1:3.

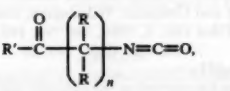
4,310,688

REDUCTION OF HYDROLYZABLE CHLORIDE IMPURITIES IN AN ISOCYANATOALKYL ESTER OF AN ORGANIC CARBOXYLIC ACID

Abel Mendoza, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 22, 1979, Ser. No. 87,594
Int. Cl.³ C07C 67/14
U.S. Cl. 560—222 15 Claims

1. In a process for preparing an isocyanatoalkyl ester of an organic carboxylic acid represented by the formula



wherein each R is independently hydrogen, alkyl, alkenyl, alkoxy, alkaryl, aralkyl or aryl; R' is hydrogen, C_1–C_{17} alkyl, C_2–C_{17} alkenyl, C_7–C_{20} alkaryl or C_6–C_{24} aryl and n is 2 or 3, said process comprising the steps of reacting a 2-oxazoline or 2-oxazine with phosgene in a water-immiscible, organic solvent in the presence of an aqueous solution of a hydrogen chloride acceptor and then separating the organic solution of the resulting isocyanatoalkyl ester from the aqueous phase, the improvement comprising the steps of:

(a) contacting the isocyanatoalkyl ester in a liquid phase with a vicinal epoxide-containing compound, said epoxide-containing compound being present in a ratio of at least about 0.5 equivalent of epoxide per equivalent of hydrolyzable chloride, so as to effect substantial reaction of the epoxide-containing compound with the hydrolyzable chloride; and

(b) separating the isocyanatoalkyl ester from the other com-

ponents of the liquid mixture resulting from Step (a) by fractional distillation.

4,310,689

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE 2-PHENOXY PROPIONIC ACIDS AND HERBICIDAL PREPARATIONS CONTAINING SUCH ACIDS

Willem Eveleens, Hengelo; Johannes Spaans, Oldenzaal, and Hendrik G. Wissink, Goor, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

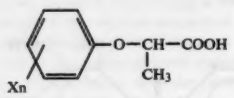
Filed Sep. 19, 1979, Ser. No. 77,147

Claims priority, application Netherlands, Sep. 19, 1978, 7809514

Int. Cl.³ C07C *59/48*

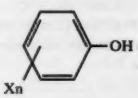
U.S. Cl. 562—472 2 Claims

1. In a process for making a D-2-phenoxy propionic acid having the formula



I.

wherein X is a halogen or methyl and n is an integer of 1 to 5 comprising reacting in water an alkali metal salt of 2-chloropropionic acid which is dextro-rotatory in water and an alkali metal phenoxide of a phenol having the formula



II.

wherein X and n have the same meanings as in formula I, the improvement which selectively produces the optical D-isomer and comprises limiting the overall water content of the reaction mixture to not more than about 8 moles of water per mole of said alkali metal salt, and maintaining the temperature of the reaction mixture at 80° C. or higher.

4,310,690

PREPARATION OF THE CALCIUM SALT OF α-HYDROXY-GAMMA-METHYLMERCAPTOBUTYRIC ACID

Earl W. Cummins, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 8, 1980, Ser. No. 195,082

Int. Cl.³ C07C *149/20*

U.S. Cl. 562—581 5 Claims

1. A process for preparing the calcium salt of α-hydroxy-γ-methylmercaptobutyric acid (MHBA) which comprises:

(a) contacting a reaction mixture obtained by hydrochloric acid hydrolysis of α-hydroxy-γ-methylmercapto butyronitrile to MHBA with aqueous sodium hydroxide, recycled wash liquor from step (f) and water to form a solution having a pH in the range of about 6.0 to 8.0; the quantity of sodium hydroxide, recycled wash and water being controlled so as to provide a filtrate in step (d) with a sodium chloride content of about 18 to 22%;

(b) mixing into the solution formed in step (a) a quantity of aqueous lime slurry prepared using recycled wash liquor from step (f), said quantity being sufficient to form a reaction mixture having a pH of about 8.5 to 11.0 at about 45° to 90° C.;

(c) filtering the reaction mixture to recover the product calcium salt and to yield a filtrate having a sodium chloride content of about 18 to 22% by weight;

(d) washing the product calcium salt with water; and

(e) retaining a portion of the wash liquor for recycling to the reaction mixture in step (a) and preparing the aqueous lime slurry used in step (b).

4,310,691

METHOD FOR SELECTIVELY RECOVERING SODIUM CITRATE FROM AN AQUEOUS SOLUTION

Sune Bengtsson, Rowayton, and Tom Lillestolen, Fairfield, both of Conn., assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Oct. 31, 1979, Ser. No. 90,003

Claims priority, application Sweden, Oct. 31, 1978, 7811278

Int. Cl.³ C07C *59/265;* C01B *17/00*

U.S. Cl. 562—584 11 Claims

1. A process for recovering sodium citrate from the spent absorbent solution utilized in an absorption/stripping process for SO_2 recovery, which comprises

a. cooling a portion of said spent absorbent solution to a temperature of about 14° C. or less, thereby causing precipitation of sodium sulfate present in said portion of absorbent solution;

b. separating the sodium sulfate precipitate from said portion of absorbent solution;

c. heating said portion of absorbent solution from which said sodium sulfate has been separated to a temperature of at least 40° C. to evaporate water and reduce the volume thereof sufficiently to cause precipitation of the sodium citrate contained therein; and

d. separating the precipitated sodium citrate from said portion of absorbent solution.

4,310,692

PROCESS FOR THE PREPARATION OF ALKYL-UREAS

Kurt Findeisen, Odenthal; Reinhard Freimuth, Munich, and Kuno Wagner, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

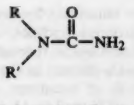
Filed Sep. 11, 1980, Ser. No. 186,355

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1979, 2937331

Int. Cl.³ C07C *127/15*

U.S. Cl. 564—61 4 Claims

1. In a process for the preparation of an alkyl-substituted urea of the formula:



wherein R and R′, which may be the same or different, represent hydrogen or a saturated hydrocarbon radical, provided that at least one represents a saturated aliphatic hydrocarbon radical, comprising reacting unpressurized, at from 110° to 170° C., urea with an amine having a boiling point, under normal pressure, at least 10° C. below the reaction temperature, said amine corresponding to the formula:

wherein R and R′ are as defined above, and wherein for each mol of urea present, at least one mol of amine is used, the improvement wherein the reaction is carried out in the presence of from 20 to 95% by weight, based on the total quantity of reactants and auxiliary agents, if any, of an organic liquid boiling, under normal pressure, above the reaction temperature, which is inert under the reaction conditions and which

serves as a dispersing agent or a solvent for the urea and for the product of the process and is a solvent for the amine.

4,310,693

O-AMINOPHENOL COMPOUNDS

Shinsaku Fujita; Koichi Koyama, and Yoshio Inagaki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

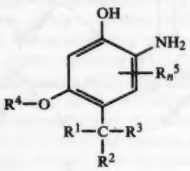
Filed Jul. 18, 1980, Ser. No. 170,234

Claims priority, application Japan, Jul. 18, 1979, 54/91185; Jul. 18, 1979, 54/91186

Int. Cl.³ C07C *149/42, 87/60, 91/40, 103/87, 103/29, 103/22, 103/26, 103/34*

U.S. Cl. 564—440 7 Claims

1. An o-aminophenol compound represented by the formula (IB)



(IB)

wherein:

R^1 and R^2, which may be the same or different, each represent an alkyl group or an aromatic group, or R^1 and R^2 together can form a ring, or R^1, R^2 and R^3 together can form a ring;

R^3 represents hydrogen atom, an alkyl group or an aromatic group;

R^4 can represent an alkyl group or an aromatic group;

R^5 can represent an alkyl group, an alkoxy group, an alkylthio group, an arylthio group, a halogen atom or an acylamino group, and n is 0, 1 or 2; and

R^4 and R^5 together can form a heterocyclic ring, R^1 and R^4 together can form a heterocyclic ring, or R^1 and R^5 together can form a ring; and

R^1, R^2, R^3, R^4, and $R^5{}_n$ contain a total of 7 or more carbon atoms.

4,310,694

P-(ALKENYLAMINO) PHENYLAMINES

Josef Ehrenfreund, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

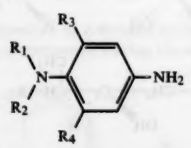
Division of Ser. No. 128,610, Mar. 10, 1980, abandoned. This application Jan. 14, 1981, Ser. No. 224,982

Claims priority, application Switzerland, Mar. 13, 1979, 2379/79; Feb. 12, 1980, 1134/80

Int. Cl.³ C07C *87/60, 127/22;* A01N *47/34*

U.S. Cl. 564—442 1 Claim

1. A compound of the formula



wherein

one of R_1 and R_2 is C_3–C_5 alkenyl, and the other of R_1 and R_2 is C_3–C_5 alkenyl or C_1–C_4 alkyl, and

each of R_3 and R_4 is chlorine or bromine.

4,310,695

STABLE EPOXY-AMINE CURING AGENT ADDUCTS

Mark F. Dante, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 17, 1980, Ser. No. 207,313

Int. Cl.³ C08G *59/50*

U.S. Cl. 564—445 6 Claims

1. A stable epoxy-amine adduct suitable for curing epoxy resins prepared by a process comprising reacting a saturated epoxy compound containing at least one vicinal epoxy group in the molecule with a stochiometric excess of an amine and then reacting the resulting condensate with a base to remove at least 75% of the chlorine in the condensate.

4,310,696

PROCESS FOR PRODUCING INORGANIC ACID SALTS OF TERTIARY BUTYL HYDRAZINE

Shiro Hojo, Sakaide; Yoichi Hasegawa, Marukame, and Mineo Nakagawa, Takamatsu, all of Japan, assignors to Japan Hydrazine Co., Inc., Tokyo, Japan

Filed Jun. 30, 1980, Ser. No. 164,229

Claims priority, application Japan, Jul. 5, 1979, 54-85433

Int. Cl.³ C07C *109/02*

U.S. Cl. 564—464 9 Claims

1. A process for producing inorganic acid salts of tertiary butyl hydrazine, which comprises reacting inorganic acid salts of hydrazine with tertiary butyl halides, thereby producing the inorganic acid salts of tertiary butyl hydrazine.

4,310,697

PROCESS FOR THE MANUFACTURE OF DIMETHYLETHYLAMINE

Bernard Cheminal, La Chambre; Paul Kiener, Saint Genis Laval, and Aime Traversaz, La Chambre, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Courbevoie, France

Filed Aug. 12, 1980, Ser. No. 177,333

Claims priority, application France, Aug. 14, 1979, 79 20650; Jul. 18, 1980, 80 15880

Int. Cl.³ C07C *85/06*

U.S. Cl. 564—479 11 Claims

1. A process for the manufacture of dimethylethylamine comprising reacting gaseous ethanol with a gaseous mixture of hydrogen and dimethylamine in the presence of a hydrogenation/dehydrogenation catalyst comprising copper and chromic oxide alone or admixed with barium oxide, zinc oxide, magnesium oxide, or other oxides, at a temperature of about 180° to 240° C. and an absolute pressure of about 1 to 15 bars for a time sufficient to form dimethylethylamine, the molar ratio of dimethylamine/ethanol being about 0.2 to 0.6 and the molar ratio of hydrogen/ethanol being about 3 to 10.

4,310,698

FLUOROCHEMICAL NON-IONIC SURFACTANTS

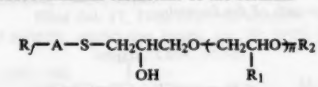
Thomas W. Cooke, Mahopac, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 953,296, Oct. 20, 1978, abandoned. This application Jul. 7, 1980, Ser. No. 166,275

Int. Cl.³ C07C *149/18;* C11D *1/722*

U.S. Cl. 568—46 10 Claims

1. A fluorochemical surfactant of the formula



wherein

R_f is perfluoroalkyl of 4–20 carbon atoms or perfluoroalkoxyperfluoroalkyl of 4–20 carbon atoms;

A is straight or branched chain alkylene of 1–10 carbon atoms which is unsubstituted or substituted by halo;

n is 1–50;

R_1 is hydrogen or alkyl of 1–4 carbon atoms; and
R_2 is hydrogan or alkyl of 1–4 carbon atoms.

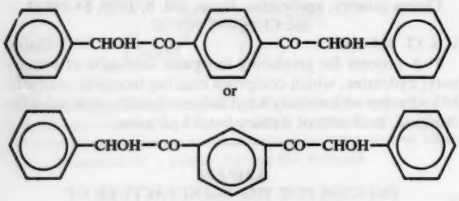
4,310,699

PROCESS FOR SYNTHESIZING BIS (PHENYLGLYOXYLOYL)BENZENES USABLE FOR MANUFACTURING POLYPHENYLQUINOXALINE RESINS

Guy Rabilloud, Grenoble, and Bernard Sillion, Lyons, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 23, 1980, Ser. No. 152,895
Claims priority, application France, May 23, 1979, 79 13424
Int. Cl.³ *C07C 45/29, 45/45*
U.S. Cl. 568—315 **11 Claims**

1. A process for preparing a bis-benzoin having the formula



said process comprising the steps of:

(a) reacting terephthalic or isophthalic aldehyde with an alkali metal cyanide in a molar ratio of cyanide to aldehyde of from 0.3:1 to 1:1 the reaction being effected in a C_{1-4} monoalcohol solvent, the amount of solvent being from 1 to 6 liters per mole of said aldehyde;

(b) adding to the resultant reaction mixture from step (a) from 3.5 to 6 moles of benzaldehyde per mole of terephthalic or isophthalic aldehyde used in step (a), at a temperature of from 0° to 30° C.; and

(c) heating the resultant reaction mixture from step (b) at a temperature of from 50° to 150° C., and recovering the resultant precipitated bis-benzoin;

whereby the recovered bis-benzoin is produced in high yield and high purity.

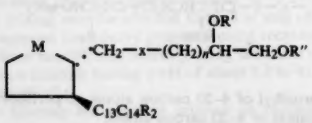
4,310,700

1-HYDROXYMETHYL-11-DEOXY-16-HYDROXY-PROSTEN-1-OL-DERIVATIVES

Allan Wissner, Ardsley, and Middleton B. Floyd, Jr., Suffern, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

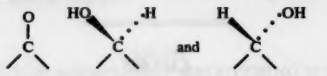
Filed Apr. 3, 1980, Ser. No. 137,085
Int. Cl.³ *C07C 49/597, 35/06*
U.S. Cl. 568—330 **75 Claims**

1. Compounds of the formula:

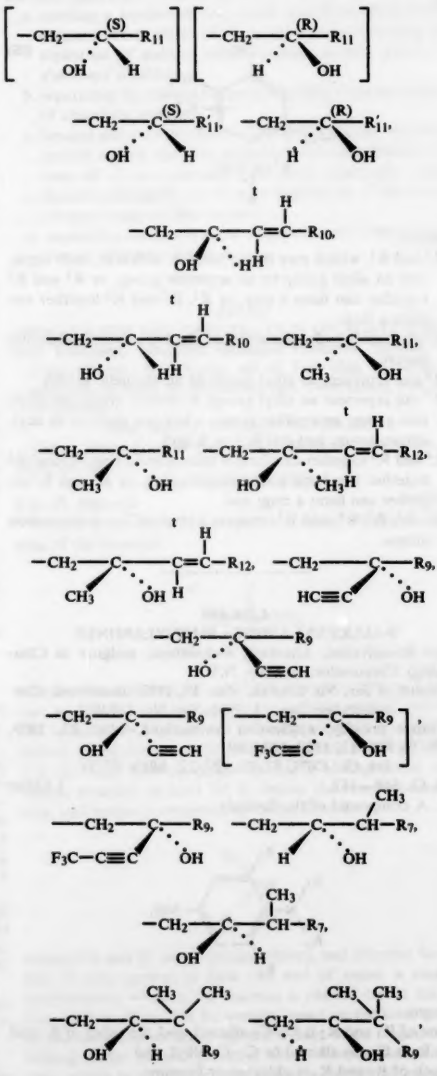


(I)

n is the integer 3–5 inclusive;
wherein M is the divalent moiety selected from the group



X is selected from the group —CH=CH— (trans) and —CH=CH—(cis); R′ and R″ are the same or different and are hydrogen, C_1 to C_4 alkyl, C_1 to C_6 alkanoyl or optionally substituted benzoyl, the substituents selected from the group C_1 to C_4 alkoxy, halo and trifluoromethyl; C_{13}–C_{14} is selected from the group —CH=CH—(trans) and —CH_2CH_2—; and R_2 is selected from the group



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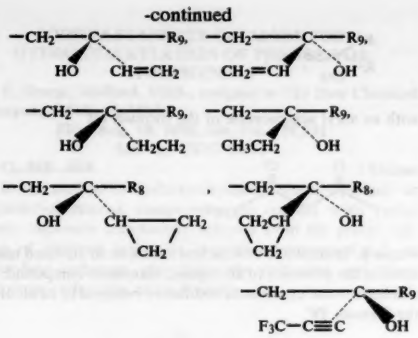


R_7 is selected from the group consisting of C_2–C_4 alkyl; R_8 is selected from the group consisting of C_1–C_2 alkyl; R_9 is selected from the group consisting of C_3—C_6 alkyl; R_{10} is selected from the group consisting of C_1–C_4 alkyl; R_{11} is selected from the group consisting of C_3–C_7 alkyl; R'_{11} is selected from the group consisting of C_3–C_7 alkyl, phenoxy, p-fluorophenoxy, and m-chlorophenoxy; R_{12} is selected from the group consisting of C_1 to C_4 alkyl the racemic mixtures thereof; and the mirror images thereof, and the pharmaceutically acceptable, nontoxic salts thereof.

4,310,701

PROCESS FOR THE PREPARATION OF HOMOLOGUES OF METHYL DIHYDROJASMONATE

Richard A. Wilson, Westfield; Braja D. Mookherjee, Holmdel; John B. Hall, Rumson, and Gilbert Stork, Englewood, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

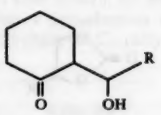
Continuation-in-part of Ser. No. 113,297, Jan. 18, 1980, Pat. No. 4,260,830. This application Nov. 13, 1980, Ser. No. 206,688

The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.

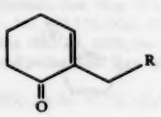
Int. Cl.³ C07C *45/66*

U.S. Cl. 568—347 **5 Claims**

1. The process of reacting the compound having the structure:



with HX in the presence of n-butanol or toluene in order to form, in one step, a compound having the structure:



wherein R is C_1–C_4 alkyl and X is chloro or bromo.

4,310,702

SELECTIVE MONOCHLORINATION OF KETONES AND AROMATIC ALCOHOLS

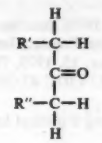
Divakaran Masilamani, Morristown, and Milorad M. Rogic, Whippany, both of N.J., assignors to Allied Corporation, Morristown, N.J.

Filed Jul. 28, 1980, Ser. No. 172,798

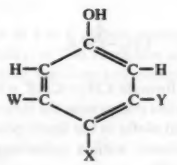
Int. Cl.³ C07C *45/63, 37/62, 148/00*

U.S. Cl. 568—348 **12 Claims**

1. A chlorination method which comprises reacting in the liquid phase sulfuryl chloride with an organic reactant which is a ketone of formula I or a phenol of formula II,

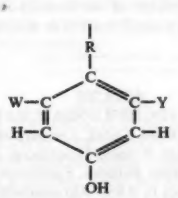


I



II

wherein formula I, R' and R'' are each alkyl of 1–3 carbons or together are alkylene of 2–7 carbons optionally substituted by methyl; wherein formula II, W and Y are each H or alkyl of 1–3 carbons, and X is H or of the formula



III

with R being a single bond, —O—, —S—, alkylene, —SO_2—, —CO— or a cyclic moiety with both bonds to the same ring carbon in the presence of a moderator selected from the group consisting of aliphatic alcohols of 1–3 carbons and aliphatic ethers of 2–6 carbons, with sufficient moderator being present to selectively produce a product substantially free of compounds with more than one chlorine atom per carbonyl or aromatic hydroxy.

4,310,703

PROCESS FOR THE PREPARATION OF CYCLOHEXANONE

Akio Tamaru; Yoshio Kinsho, and Takayuki Yoshida, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jul. 17, 1980, Ser. No. 169,898

Claims priority, application Japan, Jul. 30, 1979, 54-96957

Int. Cl.³ C07C *45/00*

U.S. Cl. 568—361 **13 Claims**

1. A process for preparing cyclohexanone by catalytic dehydrogenation of cyclohexanol in the range of 200° to 400° C., which comprises conducting the dehydrogenation in the presence of a copper-chromium catalyst derived from a mixture of copper oxide and chromium oxide having an atomic ratio of copper to chromium between 8:2 and 2:8, said mixture being subjected to heat treatment from 0.5 to 30 hours at a tempera-

ture of 650° to 900° C. in a non-reducing atmosphere until the mixture of copper oxide and chromium oxide has a specific surface area of 0.5 to 20 m^2/g and to subsequent reduction to provide the desired catalyst.

4,310,704

PROCESS FOR MANUFACTURING METHYL KETONES BY OXIDATION OF TERMINAL OLEFINS

Hubert Mimoun, Rueil-Malmaison; Robert Charpentier, Villeneuve les Sablons, and Michel Roussel, Colombes, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 18, 1979, Ser. No. 104,941

Claims priority, application France, Dec. 18, 1978, 78 35740; Jan. 11, 1979, 79 00828; Nov. 13, 1979, 79 28154

Int. Cl.³ C07C *45/28*

U.S. Cl. 568—385 **20 Claims**

1. A process for producing a methyl ketone of the formula

from an olefin of the formula $CH_2{=}CHR$ wherein R is $C_{1\text{-}20}$ hydrocarbyl, said process comprising the step consisting essentially of contacting said olefin in the liquid phase, optionally in the presence of a solvent, with a palladium catalyst and a peroxide oxidizing agent;

wherein said palladium catalyst has the formula $PdAA'(L)_m$, wherein A is fluoborate, acetate or trifluoroacetate; A' is the same as A or a π-allyl radical; L is an amine, phosphine, arsine, stibine or amide ligand; and m is 0 or 2; and

wherein said oxidizing agent is hydrogen peroxide or an organic hydroperoxide of the formula R_2OOH, wherein R_2 is $C_{4\text{-}20}$ tertiary alkyl, aralkyl or alkylaryl.

4,310,705

PREPARATION OF HIGHER UNSATURATED KETONES

Axel Nissen, Leimen; Gerd Kaibel, Lampertheim; Otto Woerz, Ludwigshafen; Lothar Arnold, Heidelberg; Manfred Braun, Mutterstadt, and Walter Rebafka, Eppelheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 26, 1980, Ser. No. 163,401

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1979, 2928944

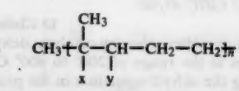
Int. Cl.³ C07C *45/48*

U.S. Cl. 568—391 **6 Claims**

1. A process for the preparation of unsaturated ketones of the formula I

(I)

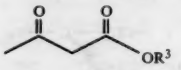
where the broken line may denote an additional C—C bond, R^1 is alkyl of 1 to 4 carbon atoms and R^2 is saturated or unsaturated alkyl, cycloalkyl or cycloalkylalkyl of 4 to 30 carbon atoms or a group of the formula



where n is an integer of from 1 to 6, x is methoxy and y is H, which process comprises reacting an unsaturated alcohol of the formula II

(II)

with an alkyl acetoacetate of the formula III


(III)

where R^3 is alkyl of 1 to 4 carbon atoms, at an elevated temperature in the presence of an organic aluminum compound, with elimination and continuous distillative removal of an alcohol of the formula IV

$$R^3—OH \qquad (IV)$$

in a reactor system carrying a fractionating column, wherein

A. the unsaturated alcohol of the formula II which is used has a boiling point higher than that of the alkyl acetoacetate used,

B. the reaction is carried out in the presence of from 0.5 to 100% by weight, based on the alcohol of the formula II, of a liquid which is inert under the reaction conditions or which cannot undergo any undesirable side-reactions and which has a boiling point between that of the alkyl acetoacetate starting material of the general formula III and the alcohol of the general formula IV to be eliminated therefrom, and

C. steps are taken to ensure that the temperature at the bottom of the fractionating column is not more than 40° C. higher than the boiling point of the added liquid, under the prevailing pressure.

4,310,706

IMIDAZOLE CATALYSTS FOR HYDROXYALKYLATION OF PHENOLS OR THIOPHENOLS

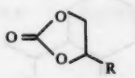
Paul E. Strege, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 18, 1980, Ser. No. 179,130

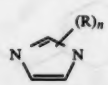
Int. Cl.³ C07C *41/03, 41/16*

U.S. Cl. 568—648 **7 Claims**

1. In the method of hydroxyalkylation wherein phenol- or thiophenol-containing compounds are reacted with cyclic organic carbonate compounds, selected from the group consisting or ethylene carbonate, propylene carbonate, 1,2- or 2,3-butylene carbonate, phenylethylene carbonate, and ethers of alkylene carbonates of the formula



wherein R is $C_{1\text{-}20}$ alkoxy, alkoxyalkylene or (poly)alkoxyalkylene, in the presence of a catalyst followed by recovery of the hydroxyalkylaryl ether formed, the improvement wherein the catalyst is of the formula



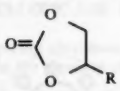
wherein R is hydrogen, phenyl, or a $C_{1\text{-}4}$ alkyl, hydroxyalkyl or alkoxy radical and n is 4.

4,310,707
SODIUM STANNATE CATALYST FOR HYDROXYALKYLATION OF PHENOLS OR THIOPHENOLS

Paul E. Strege, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 18, 1980, Ser. No. 179,131
Int. Cl.³ C07C *41/16*
U.S. Cl. 568—648 **7 Claims**

1. In the method of hydroxyalkylation wherein phenol- or thiophenol-containing compounds are reacted with cyclic organic carbonate compounds, selected from the group consisting of ethylene carbonate, propylene carbonate, 1,2- or 2,3-butylene carbonate, phenylethylene carbonate, and ethers of alkylene carbonates of the formula



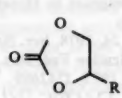
wherein R is C_{1-20} alkoxy, alkoxyalkylene or (poly)alkoxyalkylene, in the presence of a catalyst followed by recovery of the hydroxyalkylaryl ether formed, the improvement wherein the catalyst is sodium stannate.

4,310,708
PHOSPHONIUM CATALYSTS FOR HYDROXYALKYLATION OF PHENOLS OR THIOPHENOLS

Paul E. Strege, Midland, Mich., and George A. Doorakian, Bedford, Mass., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 28, 1980, Ser. No. 182,251
Int. Cl.³ C07C *41/03, 41/16*
U.S. Cl. 568—648 **8 Claims**

1. In th method of hydroxyalkylation wherein phenol- or thiophenol-containing compounds are reacted with cyclic organic carbonate compounds, selected from the group consisting of ethylene carbonate, propylene carbonate, 1,2- or 2,3-butylene carbonate, phenylethylene carbonate, and ethers of alkylene carbonates of the formula



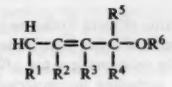
wherein R is C_{1-20} alkoxy, alkoxyalkylene or (poly)alkoxyalkylene, in the presence of a catalyst followed by recovery of the hydroxyalkylaryl ether formed, the improvement wherein the catalyst comprises a phosphonium salt of the formula $R_4P^+X^-$ wherein R is phenyl or C_{1-4} alkyl and X is a negative counterion.

4,310,709
MANUFACTURE OF BUT-2-EN-1-OL COMPOUNDS BY ISOMERIZING THE CORRESPONDING BUT-3-EN-1-OL COMPOUNDS

Walter Rebafka, Eppelheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 961,720, Nov. 17, 1978, abandoned. This application Apr. 23, 1980, Ser. No. 142,990
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1977, 2751766
Int. Cl.³ C07C *29/56, 41/32, 45/67, 67/293*
U.S. Cl. 568—687 **5 Claims**

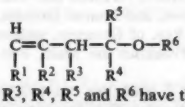
1. An improved process for the preparation of but-2-en-1-ol compounds of the general formula I



(I)

where the individual radicals R^1, R^2, R^3, R^4, R^5 and R^6 may be identical or different and each is hydrogen or an aliphatic radical, which may or may not be substituted by OH, OR (where R is an aliphatic radical), halogen or carboxyl, with the provisos that (1) R^2 may also be —CHO, (2) R^2 and R^5 together with the carbon atoms between them may also be members of an alicyclic ring, and (3) R^6 may also be a cycloalkyl of 5 to 7 carbon atoms, aralkyl of 7 to 12 atoms, phenyl, naphthyl or

where R^7 is alkyl of 1 to 6 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, aralkyl of 7 to 12 carbon atoms, phenyl or naphthyl, by isomerizing but-3-en-1-ol compounds of the general formula II



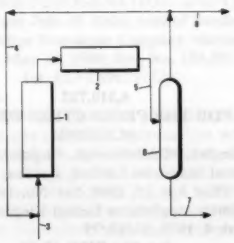
(II)

where R^1, R^2, R^3, R^4, R^5 and R^6 have the above meanings, in the presence of palladium and/or one of its compounds, and in the presence of hydrogen, at from 0° to 250° C., wherein the improvement comprises carrying out the isomerization in the presence of selenium and/or tellurium and/or one of their compounds as the co-catalyst.

4,310,710
PROCESS FOR MANUFACTURING AND RECOVERING METHYL TERT.BUTYL ETHER

Bernard Torck, Boulogne sur Seine; Alain Convers, Rueil-Malmaison; Lionel Asselineau, Paris, and Michel Hellin, Andresy, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Feb. 14, 1980, Ser. No. 121,565
Claims priority, application France, Feb. 14, 1979, 79 103937
Int. Cl.³ C07C *41/06*
U.S. Cl. 568—697 **9 Claims**



1. A process for producing methyl tert.-butyl ether, comprising the steps of:

(a) feeding a C_4 cut containing from 5 to 70% by weight of isobutene, methanol, and a recycle stream as hereinafter defined, in liquid phase, to a reaction zone containing an acid etherification catalyst, and recovering a reaction effluent containing methyl tert.-butyl ether, methanol, and

unconverted C_4 hydrocarbons, including unconverted isobutene;

(b) distilling the reaction effluent from step (a) under a superatmospheric pressure of from 7 to 30 atmospheres absolute, and separately recovering a top effluent containing C_4 hydrocarbons, including unconverted isobutene, and methanol, and a bottom product effluent of high methyl tert.-butyl ether content; and

(c) dividing the top effluent from step (b) into a first fraction and a second fraction, discharging the first fraction, and recycling the second fraction to step (a) as said recycle stream; wherein the ratio by weight of the second recycled fraction to the first discharged fraction is from 0.1:1 to 10:1.

4,310,711
PROCESS FOR PREPARING 5-CHLORO-2-NITROPHENOL

Helmut Müller, Eschborn, and Konrad Baessler, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 2, 1980, Ser. No. 183,393

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1979, 2935629

Int. Cl.³ C07C *79/32*

U.S. Cl. 568—709 **5 Claims**

1. A process for the preparation of 5-chloro-2-nitrophenol which comprises reacting 2,4-dichloronitrobenzene with 2 to 3 mols of alkali metal hydroxide per mol of 2,4-dichloronitrobenzene in the presence of an organic solvent said reaction being conducted in the presence of an aprotic polar solvent selected from the group consisting of dimethyl sulfoxide, N-methyl pyrrolidone, tetramethylene sulfone, dimethyl formamide, dimethyl acetamide and hexamethyl phosphoric acid trisamide at a temperature in the range of 30° C. to 120° C. and at normal pressure.

4,310,712
PROCESS FOR THE PRODUCTION OF PHENOL AND ACETONE

Phillip E. Langley, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

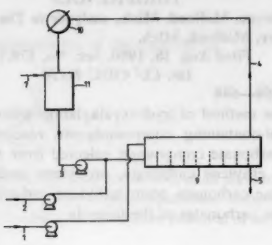
Filed Apr. 15, 1980, Ser. No. 140,600

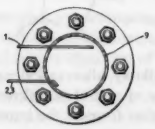
Claims priority, application United Kingdom, Apr. 20, 1979, 13904/79; Jul. 4, 1979, 23269/79

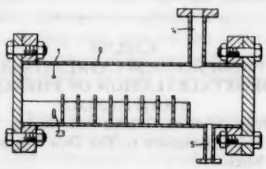
Int. Cl.³ C07C *37/08*

U.S. Cl. 568—798 **10 Claims**

1. In a process of producing phenol, acetone and alpha methyl styrene from cumene hydroperoxide which comprises mixing acetone and a decomposition catalyst with cumene hydroperoxide, flowing the mixture without substantial back mixing at a reaction temperature until conversion of the cumene hydroperoxide to phenol and acetone is substantially complete, the improvement comprising controlling the temperature of the reaction at least in part by evaporating acetone from







the mixture and thereby reducing the acetone concentration of the mixture in the course of the reaction.

4,310,713
PRODUCTION OF 1,2-DICHLOROETHANE

Günter Legutke, Brühl; Gerhard H. Rechmeier; Harald Scholz, both of Erfstadt; Kurt Schuchardt, Bühl; Ernst Höller, Bornheim-Rösberg, and Günther Liesenfelder, Erfstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 898,711

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1977, 2718878; Sep. 21, 1977, 2742409

Int. Cl.³ C07C *17/156*

U.S. Cl. 570—243 **5 Claims**

1. In a process for making 1,2-dichloroethane by subjecting ethylene to an oxychlorination reaction with hydrogen chloride and a gas containing molecular oxygen in gas phase, at temperatures of 200° to 250° C., in contact with a fluidized bed catalyst consisting substantially of copper-II-chloride on a carrier, wherein the reaction gases are cooled under pressure in a first condensation stage down to 70° to 100° C. and in a second condensation stage down to 0° to 40° C., condensed 1,2-dichloroethane and water are removed, and the bulk of unreacted starting gas and inert gas are recycled, the improvement which comprises cooling the reaction gases in the second condensation stage down to 37° to 40° C. and cooling them under pressure in a third condensation stage down to 5° to 18° C. to the extent necessary for the recycle gas to contain 0.5 to 3 volume % of 1,2-dichloroethane; directly admixing, upstream of the reactor, the recycle gas with a quantity of pure oxygen necessary to replace consumed oxygen and to re-establish an oxygen content of 12 to 25 volume % therein; and establishing an overall content of the combustible components ethylene, 1,2-dichloroethane, carbon monoxide and organic by-products which is below the lower limit of explosion of 3 to

6 volume % for an oxygen content of 25 to 12 volume %, the said overall content being established

(a) by using the ethylene, oxygen and hydrogen chloride starting reactants in a molar ratio of (1.00 to 1.10): (0.50 to 0.70): 2.00,

(b) by oxidizing 50 to 100 mol % of the carbon monoxide to carbon dioxide in contact with the catalyst, and

(c) by maintaining the necessary content of inert gas of the recycle gas by supplying it with the calculated quantity of a substance selected from air and inert gas.

4,310,714
HYDROGENATION OF α-PINENE TO CIS-PINANE

Mark S. Pavlin, Lawrenceville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Dec. 10, 1980, Ser. No. 215,033
Int. Cl.³ C07C *5/03, 13/47*
U.S. Cl. 585—275 **13 Claims**

1. A method of preparing cis-pinane, which comprises; hydrogenating α-pinene in the presence of a catalytic proportion of ruthenium.

4,310,715
STEAM DEALKYLATION PROCESS

Tansukhlal G. Dorawala, Wappingers Falls; Russell R. Reinhard, Hopewell Junction, and Edwin R. Kerr, Wappingers Falls, all of N.Y., assignors to Texaco, Inc., White Plains, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,287
Int. Cl.³ B01J *23/64;* C07C *4/12*
U.S. Cl. 585—487 **19 Claims**

1. The method of steam dealkylating a charge alkylaromatic hydrocarbon which comprises

passing a mixture consisting essentially of steam and charge alkylaromatic hydrocarbon into contact with a steam dealkylation catalyst at steam dealkylating reaction conditions for 30–180 seconds during which time the activity of the steam dealkylation catalyst, as measured by the mole percent conversion of charge alkylaromatic hydrocarbon to product dealkylated alkylaromatic hydrocarbon, decreases during the reaction period;

interrupting the flow of charge alkylaromatic hydrocarbon, thereby interrupting said reaction period, when the activity of said catalyst has decreased;

thereafter contacting said catalyst of decreased activity with steam during a regeneration period at regenerating conditions for 90–540 seconds, as the activity of said catalyst increases, thereby forming regenerated catalyst; and

recovering product dealkylated alkylaromatic hydrocarbon.

19. The method of activating an unactivated steam dealkylation catalyst

$$a(VIII)2/n{:}b(VI)2/m{:}c(I)_20{:}d(Supp)$$

wherein a is 0.002–0.75; VIII represents a metal, having valence n of Group VIII of the Periodic Table; b is 0–0.78; c is 0.00003–0.17; VI represents a metal having valence m, of Group VIB of the Periodic Table; I represents a metal of Group I of the Periodic Table; d is 0.15–0.95; and Supp represents the catalyst support which comprises

(a) maintaining the unactivated catalyst in a hydrogen atmosphere at 950° F.–1400° F. for 2–10 hours thereby forming a hydrogen-treated catalyst;

(b) maintaining the hydrogen-treated catalyst in a steam-hydrogen atmosphere at 950° F.–1400° F. for 2–10 hours thereby forming a steamed hydrogen-treated catalyst;

(c) preferably cooling the steamed hydrogen-treated catalyst to 650° F.–900° F. in a steam or steam-hydrogen atmosphere thereby forming an activated catalyst; and

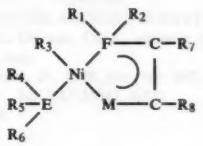
(d) recovering said activated catalyst.

4,310,716
PROCESS FOR THE OLIGOMERIZATION OF ETHYLENE IN METHANOL

David L. Beach, Gibsonia, and James J. Harrison, Glenshaw, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 18, 1980, Ser. No. 179,005
Int. Cl.³ C07C *2/02*
U.S. Cl. 585—526 **44 Claims**

1. A process for oligomerizing ethylene to normal alpha olefins and recovering said olefins from the reaction product which comprises reacting ethylene in methanol under oligomerization conditions in contact with a nickel ylide defined by the following formula:



wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 are either alike or different members selected from the group consisting of hydrogen, alkyl radicals having from about one to about 24 carbon atoms, aryl radicals having from about six to about 20 carbon atoms, alkenyl radicals having from about two to about 30 carbon atoms, cycloalkyl radicals having from about three to about 40 carbon atoms, aralkyl and alkaryl radicals having from about six to about 40 carbon atoms, halogen radicals, hydroxyl, alkoxy and aryloxy groups, and hydrocarbyl groups carrying halogen, hydroxyl, alkoxy or aryloxy groups, provided that at least one of each of R_1 to R_8 radicals is a sulfonato group or an alkyl, aryl, alkenyl, cycloalkyl, aralkyl or alkaryl carrying a sulfonato group, M is sulfur or oxygen, E is phosphorus, arsenic, antimony or nitrogen and F is phosphorus, arsenic or antimony, to obtain a reaction product containing (A) a methanol phase having dissolved therein said nickel ylide and (B) an alpha olefin phase and then separating said phases from each other to recover said alpha olefin phase.

4,310,717
OXIDATIVE DEHYDROGENATION AND CATALYST

Alan D. Eastman, and John H. Kolts, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

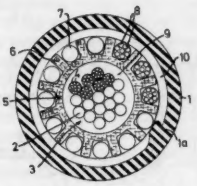
Filed May 13, 1980, Ser. No. 149,601
Int. Cl.³ C07C *5/333*
U.S. Cl. 585—661 **7 Claims**

1. An oxidative dehydrogenation process which comprises contacting at least one paraffinic hydrocarbon with a catalyst consisting essentially of a mixture of oxides of manganese, phosphorus, and an alkali metal wherein the atomic ratio of manganese:phosphorus:alkali metal is 1:0.03 to 0.25:0.06 to 0.30 under oxidative dehydrogenation conditions sufficient to convert said paraffinic hydrocarbon to the corresponding monoolefin.

4,310,718
COAXIAL CABLE FOR HIGH AMPERAGES

Kjell Eng, Mullsjö, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Dec. 18, 1979, Ser. No. 104,919
Claims priority, application Sweden, Dec. 21, 1978, 7813173
Int. Cl.³ H01B *7/34*
U.S. Cl. 174—15 WF **8 Claims**

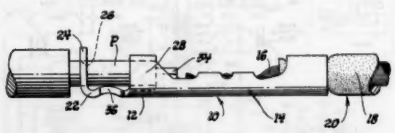


1. A liquid-cooled coaxial cable for pulsating high amperage currents, comprising a flexible, electrically insulating, water-impermeable outer casing; two groups of electrical conductors located in said casing, of which a first group of conductors is arranged as a bundle lying centrally in the casing and conducts current of a first polarity, and a second group of conductors is arranged in a ring surrounding the central bundle and conducts current of the opposite polarity; spacer means for maintaining radial distance between the two groups of conductors; there being longitudinal coolant channels for cooling the conductors formed by the interspaces between the conductors, the spacer means and the outer casing; said spacer means comprising a compressible, water-permeable body of textile material, which has an annular cross section; the central opening area within the textile spacer being substantially greater than the total area of the conductors of the first group; the conductors of the first group being arranged loosely and substantially parallel to each other without being attached to each other so as to be freely radially movable within the central spacer body opening; and the annular spacer body having at its outer circumference means for circumferentially separating the conductors of the second group from each other.

4,310,719
FEMALE TERMINAL

William E. Cross, Brookfield, and Charles R. Nestor, Niles, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 28, 1980, Ser. No. 116,039
Int. Cl.³ H02G *15/08*
U.S. Cl. 174—94 R **3 Claims**



1. An electrical female terminal adapted for resistance welding to a pin terminal comprising:

a longitudinal floor portion having an integral transverse wall at a longitudinal end thereof, said wall having a hole extending longitudinally therethrough for insertion of the pin terminal,

a first flap which is integrally attached to a longitudinal side edge of the floor portion and spaced longitudinally from the transverse wall, said first flap having a crossover portion to provide a stop for the pin terminal when it is inserted through the hole in the transverse wall,

a second flap which is integrally attached to an opposite longitudinal side edge of the floor portion and which has a crossover portion spaced closer to the transverse wall for engaging a peripheral end portion of the pin terminal when it is inserted through the hole in the transverse wall and bottomed against the stop,

said floor portion having a projection located between the transverse wall and the crossover portions of the flaps,

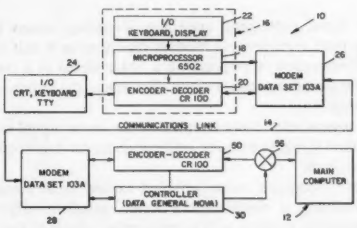
said second flap being adapted for biasing a peripheral surface of the pin terminal against the projection for resistance welding thereto,

and said crossover portion of the second flap being spaced from the transverse wall to provide access for a welding electrode to engage a peripheral surface of the pin terminal opposite the peripheral surface engaged by the projection.

4,310,720
COMPUTER ACCESSING SYSTEM

Frank T. Check, Jr., Orange, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 31, 1978, Ser. No. 892,252
Int. Cl.³ H04L *9/00*
U.S. Cl. 178—22.08 **20 Claims**

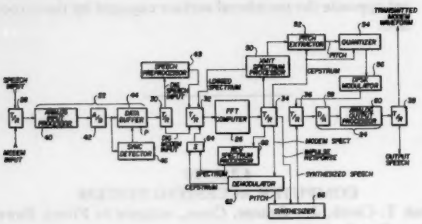


1. A system for accessing a computer by a user having an assigned password to establish a communications link for data transmission between a computer terminal and a computer, the system comprising access means at the terminal for sequentially generating a pseudorandom number of a first sequence of pseudorandom numbers, means receiving said pseudorandom number and said user assigned password and in response thereto modifying the pseudorandom number as a predetermined function of the password to provide an access code signal unique to itself, means transmitting the access code signal and identification signal from the terminal, controller means at said computer, the controller means receiving the transmitted access code signal and identification signal, the controller means including means responsive to the identification signal for sequentially generating a pseudorandom number of a second sequence of pseudorandom numbers congruent with the numbers of the first sequence and generating a signal corresponding to said user assigned password, and means for modifying said pseudorandom number of the second sequence with said last mentioned signal to provide a congruent access code signal and in response to the equality of the congruent access code signal and transmitted access code signal providing an access signal, and means receiving the access signal and in response thereto establishing a data transmission path between the terminal and the computer, said first and second sequences being the same, whereby computer access is secured through a sequential change of access codes in a pseudorandom fashion without direct transmission of said user's password.

4,310,721
HALF DUPLEX INTEGRAL VOCODER MODEM SYSTEM

Harold J. Manley, Sudbury, and Joseph de Lellis, Jr., Walpole, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 23, 1980, Ser. No. 114,777
Int. Cl.³ G10L 1/00
U.S. Cl. 179—1 SA 10 Claims



1. In signal processing apparatus including means implementing both vocoder and modem functions in a half duplex mode of operation in response to a voice signal in a transmit mode and a modem signal in a receive mode, the improvement comprising:

input means selectively coupled to the voice signal and the modem signal to provide respective digital data sequences therefrom;

common computer means coupled to said input means implementing a single fast Fourier transform algorithm adapted to perform a first multi-point complex fast Fourier transform in the transmit mode and to perform a second multi-point complex fast Fourier transform in the receive mode, said first transform being operable to effect spectrum and cepstrum analysis of the digital data sequence of the voice signal to provide pitch detection and cepstral encoding signals therefrom, and said second transform being operable to effect demodulation of the digital data sequence of the modem signal to provide pitch and impulse response signals therefrom;

first circuit means coupled to said common computer means in the transmit mode and being responsive to the pitch detection and cepstral encoding signals to generate a plurality of information bearing tone waveforms to provide a modem signal in digitized form;

first feedback circuit means connected to the output of said common computer means for feeding back a processed spectrum signal in the transmit mode to the input of said common computer means;

second circuit means coupled to said common computer means in the receive mode and being responsive to the pitch and impulse response signals to generate an output speech waveform in digitized form;

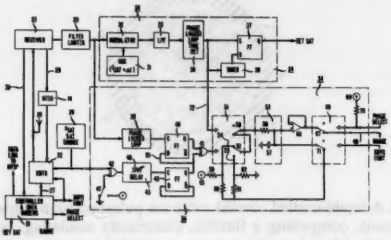
second feedback means connected to the output of said common computer means for feeding back a processed spectrum signal in the receive mode to the input of said common computer means; and

output means selectively coupled to said first and second circuit means in synchronism with said input means to provide an analog signal of either a modem signal in the transmit mode or a voice signal in the receive mode.

4,310,722
MOBILE RADIOTELEPHONE STATION TWO-WAY RANGING SYSTEM

Clifford W. Schaible, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 959,095, Nov. 9, 1978, Pat. No. 4,229,620.
This application Dec. 17, 1979, Ser. No. 104,376
Int. Cl.³ H04B 3/60
U.S. Cl. 179—2 EB 8 Claims



1. In a system for communication of radio signals including a predetermined tone, a plurality of tones, including said predetermined tone, being used in said system, circuitry (24) for detecting the presence of said predetermined tone in received signals for a predetermined signal channel and being CHARACTERIZED IN THAT there are provided

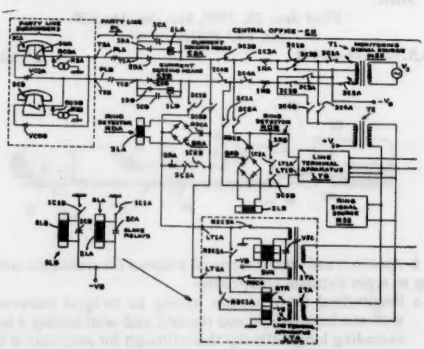
means, responsive to said received signals, for producing (31, 32) a further tone corresponding to the presence in said received signals of only a predetermined one of said plurality of tones and that is much closer in frequency to a spectral spacing frequency between adjacent ones of said plurality of tones than it is to the frequency of any of said plurality of tones, and

means having a responsive frequency bandwidth less than said spectral frequency for detecting (36) said producing means further tone.

4,310,723
PARTY LINE APPARATUS

Carl G. Svala, 79 William St., Norwalk, Conn. 06851

Filed Aug. 1, 1980, Ser. No. 174,668
Int. Cl.³ H04M 3/16, 13/00
U.S. Cl. 179—17 A 8 Claims



1. In a party line telephone arrangement having: first and second subscriber instruments each including a bell circuit, a speech circuit with a cradle switch, and a pair of transfer terminals; first and second subscriber lines with subscriber ends connected to the respective terminals of the pair of transfer terminals and central terminal ends; and a central office includ-

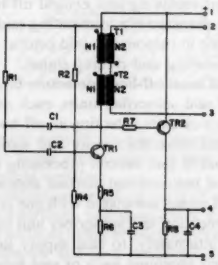
ing first and second line terminal apparatuses respectively assigned to the first and second subscriber telephones, each of said line terminal apparatuses including first and second terminals being at, during a non-ring state, a reference voltage level and a bias voltage level respectively, the improvement comprising: first unidirectional conducting means for connecting the speech circuit of the first subscriber instrument between the pair of transfer terminals thereof whereby current can only flow in a first direction through the first and second subscriber lines; second unidirectional conducting means for connecting the speech circuit of the second subscriber instrument between the pair of transfer terminals thereof whereby current can only flow in a second and opposite direction through the first and second subscriber lines; first further unidirectional conducting means for connecting the bell circuit of the first subscriber instrument between the transfer terminal thereof connected to the first subscriber line and a given reference voltage whereby current can flow through the bell circuit only in a given direction; second further unidirectional conducting means for connecting the bell circuit of the second subscriber instrument between the transfer terminal thereof connected to the second subscriber line and said given reference voltage whereby current can flow through the bell circuit thereof only in said given direction; source means for applying a d.c.-biased alternating current monitoring signal to central terminal ends of the first and second subscriber lines respectively, the instantaneous amplitude of said monitoring signal being no greater than said reference voltage; first switching means associated with one of the subscriber instruments and operative upon sensing the flow of current through the subscriber lines in a first direction for switching the connection of the central terminal ends of the subscriber lines from said source means to the terminals of the first line terminal apparatus whereby the d.c. potential of one subscriber line is greater than the d.c. potential of the other subscriber line; and second switching means associated with the other of the subscriber instrument and operative upon sensing the flow of current through the subscriber lines in a second and opposite direction for switching the connection of the central terminal ends of the subscriber lines from said source means to the terminals of the second line terminal apparatus whereby the d.c. potential of said one subscriber line is less than the d.c. potential of said other subscriber line.

4,310,724

CURRENT DETECTOR CIRCUIT

Cesar R. Gonzalez, Madrid, Spain, assignor to Amper S.A., Madrid, Spain

Filed Nov. 27, 1979, Ser. No. 98,194
Claims priority, application Spain, Jun. 21, 1979, 244.069
Int. Cl.³ H04M *3/22*
U.S. Cl. 179—18 FA **1 Claim**



1. A current detection circuit for detecting current in a circuit to be metered, particularly for the detection of on-hook and off-hook conditions of telephone equipment, said detection circuit comprising:

first and second equal transformers having primary coils connected series-aiding and secondary coils, said secondary coils being connected in series opposition with each other and adapted to be connected in series with a circuit to be metered;

an NPN transistor having a collector connected to said primary coils, such that said primary coils form a load of said collector;

a PNP transistor having a base connected to said collector of said NPN transistor by means of a first resistance, an emitter connected to a positive terminal, and a collector connected to a negative terminal by means of a first resistor-capacitor unit;

said NPN transistor having an emitter connected to said negative terminal by means of a second resistor-capacitor unit;

a resistive-divider connected to the base of said NPN transistor and to said positive terminal and forming means for polarizing said base of said NPN transistor; and

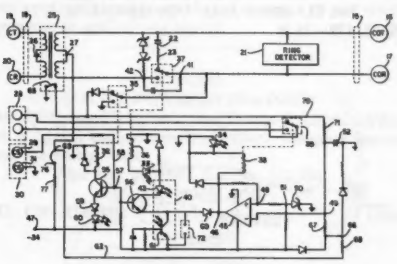
feedback means for providing feedback from said collector of said NPN transistor to said base of said NPN transistor and for provoking circuit oscillation, said feedback means comprising first and second condensers connected in series between said collector and base of said NPN transistor, and a junction between said first and second condensers being connected to said positive terminal by means of a second resistor.

4,310,725

INTERFACE FOR PRIVATE BRANCH EXCHANGE

Joseph H. Mehaffey, Atlanta, Ga., assignor to Solid State Systems, Inc., Marietta, Ga.

Filed Jan. 17, 1980, Ser. No. 112,725
Int. Cl.³ H04M *7/14;* H04Q *3/62*
U.S. Cl. 179—18 AH **7 Claims**



1. In an interface for connecting a central office ground start trunk pair to a private branch exchange including an off-hook terminal pair, the improvement comprising:

a supervision means for initially providing a supervisory signal in response to a ground condition on one conductor of said central office trunk and for continuing to provide said supervisory signal in response to the presence of loop current in said central office trunk;

said supervision means comprising an isolated switch responsive to a voltage present at a particular point, said voltage being controlled by a reed relay responsive to said loop current in said trunk.

4,310,726

METHOD OF IDENTIFYING A CALLING STATION AT A CALL TERMINATING FACILITY

Richard L. Asmuth, Oldbridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

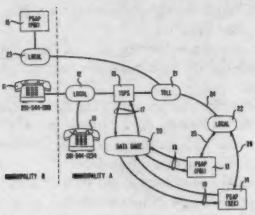
Filed Feb. 4, 1980, Ser. No. 117,828
Int. Cl.³ H04M *3/42, 7/06;* H04Q *3/72*
U.S. Cl. 179—18 B **8 Claims**

1. In a system comprising a telephone office, a plurality of telephone stations, a call terminating facility and a data net-

work between the office and facility, a method of identifying a calling station to the facility, characterized by the steps of

assigning a fictitious telephone number to a call directed to the call terminating facility responsive to receipt of the call at the office,

storing the fictitious number in conjunction with the identity of the calling station,



forwarding the call from the office to the facility using the fictitious number, and

at the facility, in response to the call directed to the fictitious number, obtaining the calling station identity from storage via the data network using the fictitious number.

4,310,727

METHOD OF PROCESSING SPECIAL SERVICE TELEPHONE CALLS

John J. Lawser, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 4, 1980, Ser. No. 117,829

Int. Cl.³ H04M *3/42, 7/06;* H04Q *3/70, 3/72*

U.S. Cl. 179—18 B **10 Claims**

1. A method of processing customized telephone calls in a telephone system comprising a plurality of telephone offices, voice facilities interconnecting said offices, and a data communications network interconnecting prescribed ones of said offices, said method being characterized by the steps of

transmitting call processing data via said data communications network to a data processing facility during a call directed to a called entity,

temporarily assigning at said data processing facility one of a plurality of fictitious telephone numbers to said call and in response to a determination at said data processing facility that said call is entitled to customized treatment, the assigned one of said fictitious numbers serving to identify said call as so entitled,

storing in a storage means of said data processing facility an identity of said called entity in association with said assigned one of said fictitious numbers,

completing said call to a terminating one of said offices serving said called entity and under control of said assigned one of said fictitious numbers,

obtaining at said terminating office from said storage means the stored identity of said called entity and in response to said completing of said call to said terminating one of said offices, and

completing said call to said called entity with customized treatment and in response to the obtained stored identity of said called entity.

4,310,728

RINGING DEVICE FOR A PRIVATE AUTOMATIC BRANCH EXCHANGE

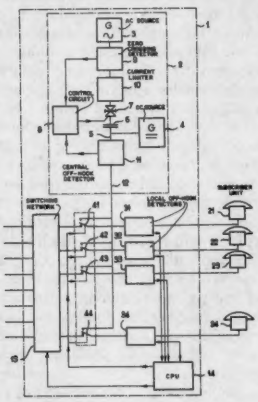
Alain G. Dumont, Saint-Vallier, France, assignor to Jeumont-Schneider, Puteaux, France

Filed Feb. 26, 1980, Ser. No. 124,745

Claims priority, application France, Mar. 12, 1979, 79 06223

Int. Cl.³ H04M *19/02*

U.S. Cl. 179—18 HB **6 Claims**



1. A ringing system for use in a private automatic branch exchange interconnecting a plurality of subscriber units in a switching network and controlled by a central processing unit, said system comprising:

(a) means for generating a ringing signal on a supply line to said subscriber units, said generating means including an AC source and a DC source for generating respectively AC and DC currents in said supply line,

(b) a centralized off-hook detection circuit connected to said supply line and responsive to a DC current in said supply line for generating a central off-hook signal,

(c) switch means receiving said central off-hook signal and operative for momentarily terminating said AC current in said supply line in response to said central off-hook signal thereby terminating said ringing signal,

(d) a plurality of local off-hook detection circuits associated with each of said subscriber units, each of said local off-hook detection circuits detecting an off-hook condition in said associated subscriber units and generating a local off-hook signal to said central processing unit, and

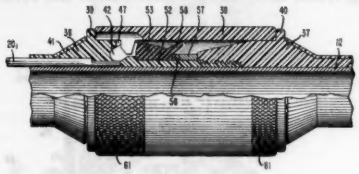
(e) a plurality of bidirectional contact means, each bidirectional contact means associated with one of said subscriber units and connecting said subscriber unit to said switching network or, alternately, to said supply line, said central processing unit receiving each of said local off-hook signals and operative to selectively actuate each of said bidirectional contact means whereby said subscriber unit is connected to said switching network when said associated subscriber unit goes off hook and said switch means simultaneously terminates said ringing signal and said subscriber unit is connected to said supply line when said associated subscriber unit is to be called.

4,310,729

SELECTOR SWITCH WITH COMMON ACTUATOR BOTH FOR CIRCUIT SELECTION AND FOR SELECTION INDICATION

Baird E. Resener, Warren, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 30, 1980, Ser. No. 164,604
Int. Cl.³ H04H *19/10;* H04M *1/30*
U.S. Cl. 179—90 R 7 Claims



1. A selector switch (13) comprising a common terminal (53), a plurality of further terminals (50) arrayed in a predetermined pattern, and means (38, 51) operable by a switch user for selectively closing an electric circuit path between one of said terminals of said plurality of terminals and said common terminal, said closing means including means for changing a terminal selection from one to another of said further terminals and in so doing causing a temporary path closure at each intervening terminal of said pattern, the switch being characterized in that it further includes

an additional terminal (57), and

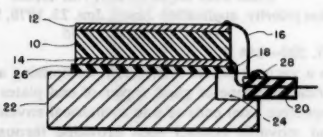
means (38, 58), actuatable by said user and including at least a part of said selective closing means, for further closing an electric circuit path between said common terminal and said additional terminal, without interrupting the closure to the selected one of the further terminals, to indicate that one of said plurality of further terminals has been selected by said user.

4,310,730

SHIELDED PIEZOELECTRIC ACOUSTIC PICKUP FOR MOUNTING ON MUSICAL INSTRUMENT SOUNDING BOARDS

Kenneth T. Aaroe, 22747 Alice St., Hayward, Calif. 94541

Filed Jul. 25, 1979, Ser. No. 60,492
Int. Cl.³ H04R *15/00;* H01L *41/04*
U.S. Cl. 179—110 A 10 Claims



1. A piezoelectric acoustic pickup comprising:

a compression mode piezoelectric crystal having first and second opposite surfaces;

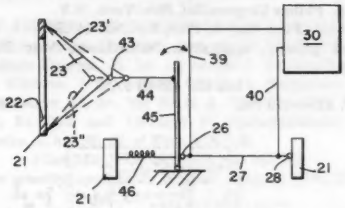
electrically conductive means on each of said first and second opposite surfaces, said conductive means on said first and second surfaces being respectively coupled to a signal output conductor and to a conductive shielding of said output conductor; and a non-resilient inertial mass having first and second opposite surfaces and side surfaces, said first surface of said mass contacting the conductive first surface of said crystal and electrically insulated from the conductive means on said first crystal surface, said non-resilient inertial mass being electrically conductive on at least said second and side surfaces, said electrically conductive non-resilient inertial mass surfaces being electrically connected to the conductive means on said second crystal surface.

4,310,731

THERMAL MOTION TRANSDUCER

George D. Carlsen, II, Hawthorne, Calif., assignor to Dyramic Compliance, Incorporated, Santa Monica, Calif.

Filed Aug. 2, 1979, Ser. No. 63,058
Int. Cl.³ H04R *15/00*
U.S. Cl. 179—110 F 14 Claims



1. A thermal motion transducer comprising:

a length of electrical wire; and

a source of driving signals coupled to said wire so as to complete an electrical circuit therethrough, for heating said wire to a predetermined temperature and for heating said wire above and below said predetermined temperature, said wire having an equilibrium length determined by said predetermined temperature and an expanded and contracted length determined by said heating above and below said predetermined temperature, such expanding and contracting causing a change in length of said wire in response to said driving signals.

4,310,732

SOUND POWERED HEADSET

William J. Stearns, Shrewsbury, and George C. Lison, Gardner, both of Mass., assignors to David Clark Company Incorporated, Worcester, Mass.

Filed Jun. 24, 1980, Ser. No. 162,506
Int. Cl.³ H04M *1/05*
U.S. Cl. 179—156 A 4 Claims

1. A sound powered headset comprising:

a curved headband,

stirrups mounted at opposite ends of said headband for pivotal movement about first axes,

earphone assemblies supported by said stirrups for pivotal movement about second axes extending transversely to said first axes, each earphone assembly conntaining means for converting electrical impulses to sound waves, said headband and stirrups being configured to operatively position said earphone assemblies over the ears of a user,

a microphone assembly, means contained within said microphone assembly for converting sound waves to electrical impulses,

arm members extending from each of said earphone assemblies for supporting said microphone in front of and in

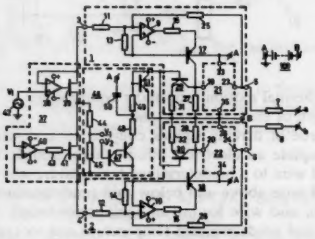
spaced relationship relative to the user's mouth when said earphone assemblies are operatively positioned, said arm members being sufficiently flexible to permit adjustment of the aforesaid spaced relationship, and

conductor means electrically connecting said microphone assembly to said earphone assemblies.

4,310,733
ARRANGEMENT FOR APPLYING SIGNALS TO A TELEPHONE LINE

Franciscus A. C. M. Schoofs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 8, 1980, Ser. No. 147,973
Claims priority, application Netherlands, May 28, 1979, 7904159
Int. Cl.³ H04B *3/58*
U.S. Cl. 179—170 NC **5 Claims**



1. An arrangement for applying signals to a two-wire telephone line, comprising two line control circuits, each having an input for receiving the signals to be applied to the telephone line and each having an output to which two line resistors are connected for connecting the respective outputs to a wire of the telephone line, characterized in that each line control circuit comprises an amplifier circuit having an input stage constituted by an operational amplifier, an intermediate stage constituted by a transistor which is arranged as a voltage amplifier, this intermediate stage being coupled to an output of the operational amplifier, also comprising a power output stage which includes two complementary transistor circuits arranged in a push-pull configuration for connection between the terminals of a d.c. voltage source, and a feedback circuit from an output of the power output stage to an input of the operational amplifier.

4,310,734
ELECTRIC CIRCUIT UNIT

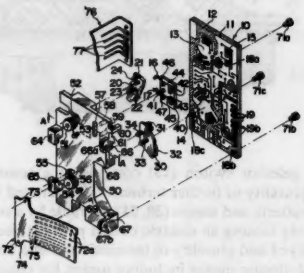
Maki Yamashita, and Shinji Tominaga, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 8, 1979, Ser. No. 37,306
Claims priority, application Japan, May 9, 1978, 53-55316
Int. Cl.³ H01H *21/62*
U.S. Cl. 200—11 R **8 Claims**

1. An electric circuit unit which comprises

a substrate having a front surface and a rear surface, said substrate being composed of two attached plate-like elements, the exposed surface of one plate-like element constituting the front surface of said substrate and the exposed surface of the second plate-like element constituting the rear surface of said substrate, said front surface of said substrate including a printed electrical circuit thereon which includes at least one group of switch terminals and said rear surface of said substrate including a multiplicity of electrical circuit elements and an additional electrical circuit printed thereon, said substrate including means to electrically connect said additional electrical circuit printed on said rear surface of said substrate with said electrical circuit printed on said front surface of said substrate,

a cover means attached to said substrate, said cover means including portions capable of enclosing each group of switch terminals on said substrate front surface to protect them from the accumulation of dust, said cover means also including at least one opening therethrough for association with each set of switch terminals on said front surface of said substrate and a means for determining the positioning of said cover means with respect to said substrate,



a movable contact means positioned between said cover means and each group of switch terminals on said front surface of said substrate, each movable contact means including an extension portion which extends through an associated opening in said cover means to extend beyond said cover means in a direction opposite said substrate, and multiple contact portions which are capable of electrically contacting the associated group of switch terminals on said front surface of said substrate, movement of each movable contact means by operation of each extension portion thereof acting to change the switch terminals contacted by the contact portions thereof.

4,310,735
ARC-SHIELD SUPPORTING STRUCTURE OF A VACUUM POWER INTERRUPTER

Shinzo Sakuma, Shinoharadai, and Junichi Warabi, Shizuoka, both of Japan, assignors to Kabushiki Kaisha Meidensha and Gemvac, both of Tokyo, Japan

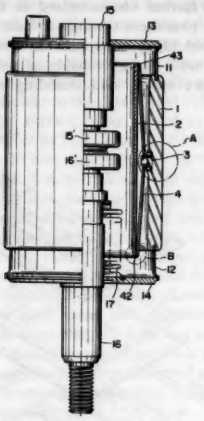
Filed Jun. 18, 1979, Ser. No. 49,456
Claims priority, application Japan, Jun. 23, 1978, 53-86127[U]
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **7 Claims**

1. In a vacuum power interrupter, comprising an insulating cylindrical envelope of glass, a pair of end plates fastened to the respective axial ends of said cylindrical envelope, stationary and movable contact rods provided through said end plates, respectively, so that they are aligned to each other in the axial direction of the insulating envelope, the stationary and movable contact rods each have electrical contacts attached thereto at the opposite ends thereof, and an arc-shield member disposed within the envelope to surround the electrical contacts,

the improvement comprising:

(a) a plurality of hollow cylindrical supporting means each having substantially the same coefficient of thermal expansion of said insulating envelope, including a tubular supporting portion and a turnover outwardly U-shaped end portion, said end portion being embedded in an inner wall of said insulating cylindrical glass envelope so that the axis of said hollow cylindrical supporting means is directed in the radial direction of said envelope, and

(b) a plurality of connecting metallic elongated plates, one end of which is fitted over an exterior surface of said



arc-shield member while the other end of which is fixed to the exterior surface of said arc-shield member.

4,310,736

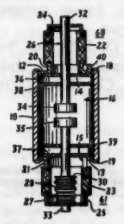
VACUUM CIRCUIT INTERRUPTER

Koichi Takeuchi; Takeo Okada, and Shinichi Aoki, all of Amagasaki, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

Continuation of Ser. No. 444,348, Feb. 21, 1971, abandoned, which is a continuation-in-part of Ser. No. 184,207, Sep. 27, 1971, abandoned, and Ser. No. 184,597, Sep. 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 808,263, Mar. 18, 1969, Pat. No. 3,668,350, which is a continuation of Ser. No. 805,221, Mar. 7, 1969, abandoned, said Ser. No. 184,207, is a continuation-in-part of Ser. No. 805,223, Mar. 7, 1969, abandoned. This application Sep. 4, 1975, Ser. No. 610,397

Int. Cl.[3] H01H *33/66*

U.S. Cl. 200—144 B 9 Claims



1. In a vacuum circuit interrupter of the type having an evacuated housing including a metallic portion and an electrically insulative portion; at least one pair of relatively movable opposed contacts within said housing and electrically insulated from each other; and means actuatable to position said contacts relative to each other between a contacting position and separated positions; the improvement comprising:

at least one of said contacts including copper as a base metal and a second metal selected from the group consisting of bismuth, tellurium, antimony, and silver, and said second metal having a melting-point and a boiling point sufficiently lower than those of the copper base metal to inhibit fusion of the contacts during interruption of low currents; and

a low magnetic permeability stainless steel shield disposed to prevent metal vapor from said contacts from being condensed on the insulative portion of said evacuated housing, and said low magnetic permeability steel having a low coefficient of adhesion with said second metal to effect a low deposition rate of vapor of said second metal from said contacts thereon.

4,310,737

PIPE RESISTANCE BUTT WELDING APPARATUS

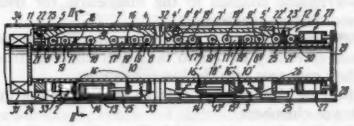
Boris E. Paton, ulitsa Chkalova, 41-a, kv. 26; Vladimir K. Lebedev, ulitsa Engelsa, 25, kv. 12; Sergei I. Kuchuk-Yatsenko, ulitsa Filatova, 1/22, kv. 47; Vasily A. Sakharnov, ulitsa Solomenskaya 41, kv. 93; Boris A. Galyan, ulitsa Lenina, 88/92, kv. 110, and Alexandr P. Miroshnichenko, ulitsa Chumaka, 4, kv. 58, all of Kiev, U.S.S.R.

Filed May 14, 1980, Ser. No. 149,735

Claims priority, application U.S.S.R., Aug. 6, 1979, 2789202

Int. Cl.[3] B23K *11/00*

U.S. Cl. 219—59.1 7 Claims



1. A pipe resistance butt welding apparatus comprising:

an elongated supporting member;

a plurality of clamping shoes and current-feeding shoes, radially movable towards and away from the pipes to be welded to locate the pipes before fusion and to feed the welding voltage to the welding zone respectively;

a fixed internal expanding clamp to locate the pipes to be welded, mounted on said supporting member and comprising at least three lengthwise beams each pivotally coupled at one end with one end of said supporting member for radial-translatory movement with respect to the axis of said supporting member and carrying on the outside of its ends a clamping shoe and a current-feeding shoe of said plurality of clamping shoes and current-feeding shoes and on its inside having bevels, and drive rollers being in a rolling-contact relation with said supporting member to move along the supporting member to act upon the bevels of said at least three beams;

a drive of said rollers to accomplish said function in said fixed expanding clamp;

a movable expanding clamp to locate the pipes being welded, mounted beside said fixed expanding clamp on said supporting member and comprising carriages movable along said supporting member, at least three lengthwise beams each pivotally coupled at one end with said carriages for radial-translatory movement with respect to the axis of said supporting member and carrying on the outside of its ends a clamping shoe and a current-feeding shoe of said plurality of clamping shoes and current-feeding shoes and on its inside having bevels, and drive rollers being in a rolling-contact relation with said supporting member to move along the supporting member to act upon the bevels to said at least three beams;

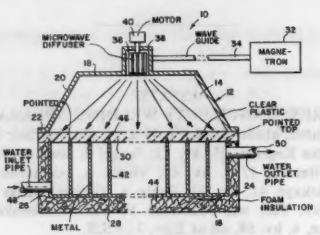
a drive of said rollers to accomplish said function in said movable expanding clamp; and

a device for axially moving said movable expanding clamp in fusion and upsetting, mounted on said supporting member beside said movable expanding clamp and coupled with said movable expanding clamp.

4,310,738
MICROWAVE FLUID HEATING SYSTEM

Michael Moretti, West Islip, and Dennis McCann, Babylon, both of N.Y.

Filed Feb. 8, 1980, Ser. No. 120,003
Int. Cl.³ H05B 6/78
U.S. Cl. 219—10.55 A 6 Claims



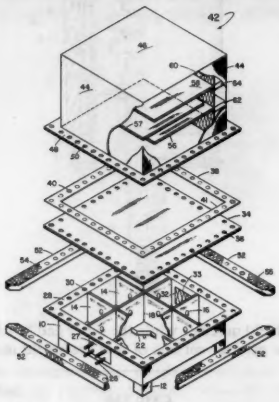
1. A microwave heating system, comprising:
a housing having an upper dispersing chamber and a lower heating chamber;
a magnetron for generating microwaves;
a waveguide coupled to the magnetron for transmitting microwaves therefrom;
a diffuser receiving the microwaves through the waveguide and spreading them into the upper chamber from where they cam pass into the lower chamber;
a sheet of clear plastic material separating the upper and lower chambers;
a plurality of upright metal baffle walls extending from the bottom of said chamber to said sheet of plastic and having pointed top edges which are embedded into the sheet of plastic, said metal baffle walls in combination with the sheet of plastic and the bottom of the lower chamber defining an enclosed main circuitous path occupying the entire lower chamber, said circuitous path being an interleaved serpentined path;
inlet means coupled to the main circuitous path in the lower chamber for providing a fluid into the main circuitous path where it will be directly heated by the microwaves; and
outlet means coupled to the main circuitous path in the lower chamber for removing the heated fluid;
whereby the fluid flows circuitously from the inlet end to the outlet end circuitously back to the inlet end, and then circuitously back to the outlet end again.

4,310,739
FLUID HEATER POWERED BY MICROWAVE ENERGY

John P. Hatem, 2813 Pheasant Hollow Dr., Plainsboro, N.J. 08536

Filed May 19, 1980, Ser. No. 151,089
Int. Cl.³ H05B 6/80
U.S. Cl. 219—10.55 A 9 Claims

1. A fluid heating apparatus that utilizes electromagnetic energy for the heating of the fluid, comprising:
(a) means for producing, high frequency electromagnetic energy;
(b) container means wherein the fluid is heated, said container means including an inlet for receiving fluid in an unheated condition, and including an outlet for the discharge of heated fluid for outside use, said inlet and outlet including connections adopted for fluid-tight operation;
(c) means for dispersing said electromagnetic energy in the direction of said container means, whereby the fluid therein is heated;
(d) a base positioned in juxtaposition to said container means, said means for producing and dispersing said high frequency electromagnetic energy disposed in and on said base;
(e) means for separating said container from said base and interconnected there between, said separating means assisting in retention of the fluid in said container and preventing incursion of the fluid into said base, said separating means further characterized in that said dispersed energy can pass there through to heat said fluid; and
(f) means for shielding said apparatus, whereby the escape of electromagnetic energy outside of the apparatus is substantially prevented, said shielding means including a

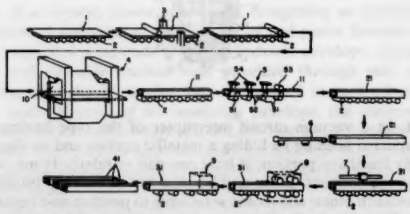


metal mesh screen of predetermined design disposed within said container means in close proximity to the wall thereof including said inlet and said outlet, said mesh screen allowing the passage of the fluid there through, said heating apparatus further including a plurality of baffles arranged in predetermined order within said container means, said waveguide cooperating with said baffles to effect a serpentine flow of the fluid from said inlet to said outlet.

4,310,740
PROCESS FOR PRODUCING LARGE-SIZED RECTANGULAR OR SQUARE STEEL PIPES

Norio Nakazima, Fukui, Japan, assignor to Kabushikikaisha Nakazima, Osaka, Japan

Filed Jun. 13, 1979, Ser. No. 48,535
Claims priority, application Japan, Jul. 7, 1978, 53/83411
Int. Cl.³ B23K 31/06
U.S. Cl. 219—61.11 1 Claim



1. A process for producing large-sized steel pipe of rectangular or square configuration having planar sides and uniformly curved corners from a thick metal plate, comprising:
bending a thick metal plate of from 9 to 25 mm thickness to form a longitudinally extending base, opposed sidewalls angularly disposed relative to said base at respective angles greater than 90°, and a top wall constituted by inwardly directed extensions of said sidewalls which termi-

nate in spaced apart longitudinally extending edges, said extensions being angularly disposed against said sidewalls at respective angles of about 90°,

positioning a first forming roll unit having a horizontal first outer lower roll, two first outer side rolls angularly disposed relative to said first outer lower roll at greater than 90° and a first inner roll having an outer cylindrical surface and outwardly facing substantially planar faces generally perpendicular to the axis of said cylindrical surface, said cylindrical surface being joined to said outwardly facing planar faces by first curved portions having a radius of from 24 to 75 mm depending on the thickness of said metal plate, said first outer lower roll and said first outer side rolls being respectively in contact with the underside of said base and said sidewalls of said bent plate, adjusting the vertical position of said first inner roll to an adjusted position according to the cross sectional dimension of the steel pipe to be produced such that said first inner roll is in contact with the inside of said base of said bent plate, said horizontal first outer lower roll, said two first outer side rolls and said first inner roll each having an axis of rotation disposed in a first common plane such that said base is sandwiched between said first inner roll and said horizontal first outer lower roll at a position aligned with said two first outer side rolls,

positioning one or more second forming roll units each having a horizontal second outer lower roll, two second outer side rolls angularly disposed relative to said second outer lower roll at greater than 90° but less than the angle at which said two first outer side rolls are angularly disposed relative to said first outer lower roll, and a second inner roll having an outer cylindrical surface and outwardly facing substantially planar faces generally perpendicular to the axis of the last said cylindrical surface, said cylindrical surface being joined to said outwardly facing planar faces by second curved portions having a radius of from 24 to 75 mm depending on the thickness of said metal plate, said second outer lower roll and said second outer side rolls being respectively in contact with the underside of said base and said sidewalls of said bent plate, and adjusting the vertical position of said second inner roll to an adjusted position according to the cross sectional dimension of the steel pipe to be produced such that said second inner roll is in contact with the inside of the base of the bent plate, said horizontal second outer lower roll, said two second outer side rolls and said second inner roll each having an axis of rotation disposed in a second common plane such that said base is sandwiched between said second inner roll and said horizontal second outer lower roll at a position aligned with said two second outer side rolls,

positioning a third forming roll unit situated after said first and second forming roll units, said third forming roll unit having a horizontal third outer lower roll, two vertical third outer side rolls and an upper roll, said third outer lower roll being in contact with the underside of said base, said third outer side rolls being in contact with said sidewalls, and said upper roll being in contact with said top wall;

effecting relatively longitudinal movement of said bent plate between said first and second forming roll units to thereby stepwise bend said sidewalls and simultaneously bend the corners between said sidewalls and said base against said first and second curved portions of said first and second inner rolls respectively such that said curved corners conform to the curved configuration of said curved portions of said first and second inner rolls, said sidewalls being bent against said planar faces so as to be disposed at about 90° relative to said base, said first and second common planes being perpendicular to said direction of longitudinal movement of said bent plate, pressing said plate on its four sides by said third forming roll unit into the desired rectangular or square configuration of from 350 to 600 mm with said longitudinal extending extensions in abutting relationship; and

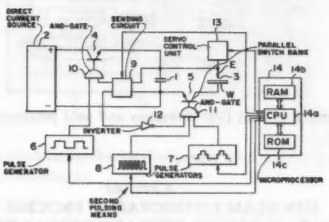
welding said abutting longitudinal extending extensions to form said steel pipe having planar sides and uniformly curved corners.

4,310,741

STORAGE-CAPACITOR-TYPE EDM POWER SUPPLY

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Feb. 7, 1980, Ser. No. 119,565
Claims priority, application Japan, Feb. 9, 1979, 54-14094
Int. Cl.[3] B23P 1/02
U.S. Cl. 219—69 P **5 Claims**



1. A power-supply system for electrical discharge machining comprising:

a direct-current source connected in series with first and second switch means to a machining gap formed between a tool electrode and a workpiece;

a storage capacitor connected to said direct current source in parallel with said machining gap;

a charging circuit connecting said direct-current source to said capacitor and including said first switch means;

a discharging circuit connecting said capacitor to said machining gap and including said second switch means directly in series with said gap;

first pulsing means for controlledly turning on and off said first switch means to permit said capacitor to store a predetermined charge from said DC source; and

second pulsing means for controlledly turning on and off said second switch means to permit said predetermined charge stored on said capacitor to be discharged directly through said machining gap to provide a discharge current therein of a predetermined waveform preset in said second pulsing means.

4,310,742

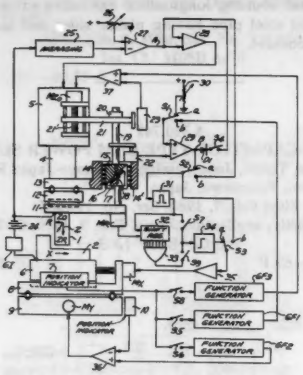
EDM PROCESS AND APPARATUS FOR MACHINING CAVITIES AND SLOTS IN A WORKPIECE

Jean Pfau, Collonge-Bellerive, Switzerland, assignor to Ateliers des Charmilles, S.A., Geneva, Switzerland

Continuation of Ser. No. 862,449, Dec. 20, 1977, abandoned. This application Jan. 14, 1980, Ser. No. 111,930
Int. Cl.[3] B23P 1/08
U.S. Cl. 219—69 M **12 Claims**

1. A method for machining by EDM cavities and slots in an electrode workpiece by means of an electrode tool wherein said electrodes are displaced relative to each other in a first direction and in a second direction, said displacement being controlled in such a manner as to maintain a predetermined machining condition in a machining zone between said electrodes and as to maintain a relative position between said electrodes at most equal to a predetermined limit value, and

effecting said second displacement in said second direction as a function of the difference between the amplitude of said dis-



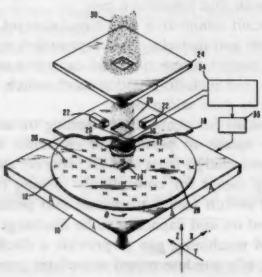
placement in said first direction and said predetermined limit value.

4,310,743

ION BEAM LITHOGRAPHY PROCESS AND APPARATUS USING STEP-AND-REPEAT EXPOSURE

Robert L. Seliger, Agoura, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 24, 1979, Ser. No. 78,539
Int. Cl.³ B23K *15/00*
U.S. Cl. 219—121 EB **10 Claims**



1. An ion beam lithography process for exposing a large area target to a patterned ion beam by successive independent exposures in a manner which accommodates lateral distortions in said target comprising:

(a) aligning a first selected segment of said target and the pattern of said patterned ion beam, the area of said selected segment being chosen to optimize the resolution, throughput, yield, and cost of said process, and the size of said pattern being approximately equal to the size of said first selected segment;

(b) exposing said first selected segment to said patterned ion beam;

(c) moving said target in a step of a length substantially equal to the width of said first selected segment, to a second or subsequent selected segment of said target, the area of said second or subsequent segment being substantially equal to the area of said first selected segment;

(d) aligning said second or subsequent selected segment of said target and said pattern of said patterned ion beam;

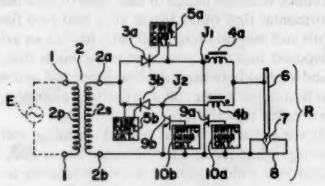
(e) exposing said second or subsequent selected segment to said patterned ion beam, whereby said target is moved in said step from said first selected segment to said second or subsequent selected segment, and said second segment is exposed to said patterned ion beam after the movement in said step and after said aligning, and said movement in said step and said exposure is repeated for additional subsequent selected segments of said target to ultimately expose the total area of said target and to thereby optimize the resolution, throughput, yield, and cost of said process.

4,310,744

A.C. ARC WELDER

Toshiyuki Okada, Mino, Japan, assignor to Osaka Transformer Co., Ltd., Osaka, Japan

Filed Jul. 24, 1980, Ser. No. 172,071
Claims priority, application Japan, Jul. 26, 1979, 54-95916
Int. Cl.³ B23K *9/09*
U.S. Cl. 219—130.51 **9 Claims**



1. An a.c. arc welder comprising:

a transformer including a primary winding adapted to receive a single phase a.c. current from an a.c. power source and at least one secondary winding;

an electrode adapted to produce a welding arc between said electrode and a workpiece, said electrode, arc and workpiece constituting a welding load;

a first welding current path established between opposite ends of said secondary winding and including a first phase control circuit, a first reactor and said welding load which are connected in series between opposite ends of said secondary winding, said first phase control circuit being responsive to each of positive polarity half-cycles of the a.c. power and provided for allowing current from said secondary winding to pass therethrough in a controlled phase, said first reactor provided for accumulating an electric power when the voltage from said secondary winding is higher than that across the welding load and dissipating said accumulated power when the voltage from said secondary winding is lower than that across the welding load;

a second welding current path established between opposite ends of said secondary winding and including a second phase control circuit, a second reactor and said welding load which are connected in series in said second welding current path, said second phase control circuit being responsive to each of negative polarity half-cycles of the a.c. power and provided for allowing current from said secondary winding to pass therethrough in a controlled phase, said second reactor provided for accumulating an electric power when the voltage from said secondary winding is higher than that across the welding load and dissipating said accumulated power when the voltage from said secondary winding is lower than that across the welding load;

a first bypass circuit connected in parallel to said first reactor and said welding load, said first bypass circuit including a first switching circuit for conducting said first bypass circuit during a period of time which is within a period of dissipation of the power accumulated in the first reactor; and

a second bypass circuit connected in parallel to said second reactor and said welding load, said second bypass circuit

including a second switching circuit for conducting said second bypass circuit during a period of time which is within a period of dissipation of the power accumulated in the second reactor.

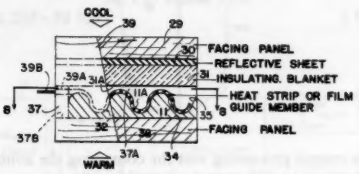
4,310,745
HEATING ASSEMBLIES

Joseph Bender, Winnipeg, Canada, assignor to Huebner Bros. of Canada Ltd., Winnipeg, Canada

Continuation-in-part of Ser. No. 32,099, Apr. 20, 1979, abandoned, which is a continuation-in-part of Ser. No. 794,359, May 6, 1977, abandoned. This application Nov. 26, 1979, Ser. No. 97,559

Int. Cl.³ H05B *1/00*

U.S. Cl. 219—213 **8 Claims**



1. A heating assembly for use with a source of electrical power and comprising in combination a panel construction including an insulated heat film panel and a facing material panel on one side thereof, means to operatively connect said heat film panel with the source of electrical power, and means to guide said heat film panel in a corrugated configuration, said last mentioned means including at least two support and guide members situated in spaced and parallel relationship with one another upon said facing material panel, the upper surfaces of said guide members being corrugated, said heat film panel passing over said corrugations in serpentine formation and being secured in position to said corrugations, spacer means on said facing material panel, and a further facing material panel on the other side of said heat film panel, said spacer means maintaining said facing panels apart and defining an air space between said corrugated heat film panel and the underside of said further facing material panel.

4,310,746
ELECTRIC FLUID HEATING APPARATUS

Kenneth E. Elkern, 3008 Chicago Rd., South Chicago Heights, and Henning H. Nielsen, R.R. 3, Box 1197, Crete, both of Ill. 60417

Continuation-in-part of Ser. No. 709,542, Jul. 28, 1976, abandoned. This application May 8, 1978, Ser. No. 903,933

Int. Cl.³ H05B *1/00*; F24H *3/08*; F28D *15/00*

U.S. Cl. 219—326 **2 Claims**

1. Heating apparatus comprising:

a thermally insulated housing;

a vertical, thermally insulated partition dividing the housing into a flue passage and a heat exchange chamber, said partition having top and bottom openings to provide communication between the flue passage and opposite ends of the chamber;

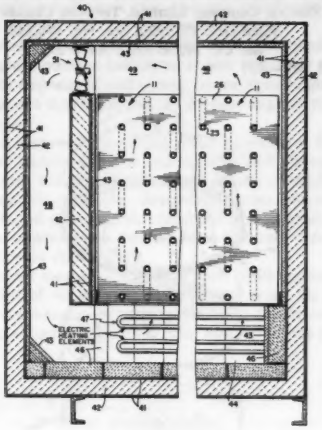
a heat exchanger in the heat exchange chamber, said exchanger comprising an array of pipes and fins;

an air plenum above the heat exchanger;

a firebox below the heat exchanger, said firebox lined with firebrick;

heating elements within the firebox;

air moving means in the housing for circulating air from the flue passage, through said bottom opening to the firebox, over the heating elements, up over the heat exchanger to the plenum and from said plenum through said top opening to the flue passage; and



means for circulating fluid to be heated through the pipes of the heat exchanger.

4,310,747
METHOD AND APPARATUS UTILIZING A POROUS VITREOUS CARBON BODY PARTICULARLY FOR FLUID HEATING

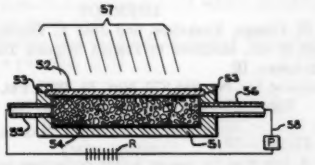
Warren A. Rice, Dexter; Clarence S. Vinton, Ann Arbor; Charles H. Franklin, Ann Arbor, and Christopher J. Torbett, Ann Arbor, all of Mich., assignors to The Fluorocarbon Company, Anaheim, Calif.

Division of Ser. No. 928,051, Jul. 26, 1978, Pat. No. 4,220,486. This application Mar. 7, 1980, Ser. No. 128,193

The portion of the term of this patent subsequent to Sep. 2, 1997, has been disclaimed.

Int. Cl.³ H05B *3/14*; C01B *31/00*

U.S. Cl. 219—381 **7 Claims**



1. A method for supplying heat to a fluid which comprises:

(a) providing a body of rigid, interconnected, multidirectional and continuous strands of vitreous carbon forming a rigid, porous, three dimensional skeletal structure, said body being so structured that it can withstand sustained heating in air to about nominally 350° C. without cracking or significant electrical resistance change measured at room temperature; and

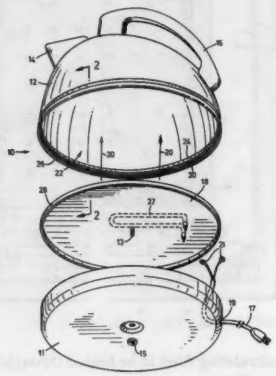
(b) supplying electrical or electromagnetic energy to the body such that a fluid flowing in the body is heated by heat transfer.

4,310,748

ELECTRIC KETTLE RESERVOIR ASSEMBLY

William P. Paulin, Barrie, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed Oct. 17, 1980, Ser. No. 198,112
Int. Cl.[3] H05B 1/02; A47J 27/21
U.S. Cl. 219—437 7 Claims



1. An electric kettle having a shell member including a spout and a handle, an inner bottom member for said shell member together defining a water reservoir, a bottom cover for said inner member, an electrical heating element positioned within said water reservoir, an electrical connection for said electrical heating element, and fastening means for securing said inner member in water-tight sealing relation with said shell member comprising lip means bounding said shell member and projecting inwardly therefrom, shoulder means formed from said shell member projecting inwardly adjacent to said lip means, flange means of said bottom member engaging said lip and shoulder means of said shell whereby said inner member is held in fixed relation to said shell member, and gasket means positioned between said inner member and said shell member.

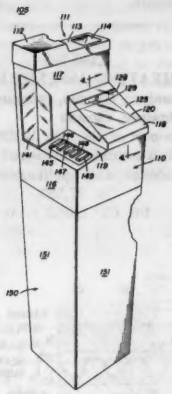
4,310,749

FARE COLLECTION SYSTEM AND COMPONENTS THEREOF

Jim H. Gomez, Kankakee, and Jose E. Davila, Bourbonnais, both of Ill., assignors to Transit Systems Technology, Inc., Kankakee, Ill.

Division of Ser. No. 855,970, Nov. 30, 1977, Pat. No. 4,210,801. This application May 14, 1980, Ser. No. 149,843
Int. Cl.[3] G07B 15/00
U.S. Cl. 235—29 R 12 Claims

1. A fare box for use in a fare collection system having a central processing unit with an extractor conduit having one end in communication therewith and an extractor coupling on the other end thereof, said fare box comprising a pedestal open at the upper end and having a top closing the upper end, said pedestal having a coin collection chamber for receiving coins therein and a paper collection chamber for receiving paper therein, said top having a coin receiving slot therein communicating with said coin collection chamber and a paper receiving slot therein communicating with said paper collection chamber, a counter-recorder in said fare box for counting and recording the paper entering said paper receiving slot prior to dropping into said paper collection chamber, and coupling structure in said pedestal for cooperating with the extractor coupling to provide communication between said chambers



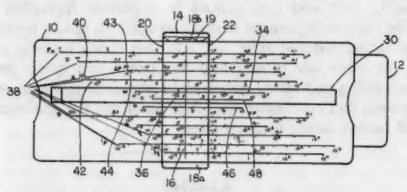
and the central processing unit for conveying the contents of said chambers to said central processing unit.

4,310,750

TACTICAL NUCLEAR SLIDE RULE FOR A PLURALITY OF ENVIRONMENTS

Clair S. Kelley, Reston, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 31, 1978, Ser. No. 938,560
Int. Cl.[3] G06G 1/02
U.S. Cl. 235—70 A 6 Claims



1. Means for computing probability of damage to an item located a specified distance from a detonation site of a weapon having a predetermined yield comprising:

(a) stationary means, having a plurality of stationary means scales associated therewith,

(b) slide means in sliding relationship with said stationary means and having a plurality of sliding means scales associated therewith,

(c) said stationary means scales and said sliding means scales each comprising a plurality of indicia,

(d) movable aligning means associated with said stationary means and with said slide means for aligning various indicia on the scales thereof,

(e) one of said slide and stationary means having a first scale thereon representative of weapon yield,

(f) the other of said slide and stationary means having a set of scales representative of a set of environmental parameters,

(g) the other of said slide and stationary means having a set of distance scales thereon, each one of said distance scales being associated with one of said environmental parameter scales, respectively, and each of said distance scales being aligned in a predetermined manner with respect to the other said distance scales and with respect to said weapon yield scale whereby any one of said set of envi-

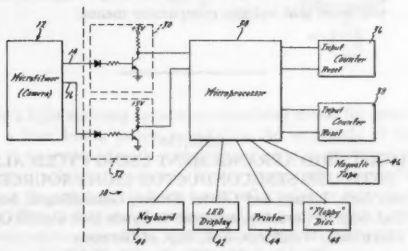
ronmental parameters may be computed by aligning said scale representative of weapon yield with a selected one of said distance scales, displacing said movable aligning means to correspond to said predetermined weapon yield, and obtaining said any one environmental parameter from a corresponding one of said set of scales of said other of said slide and stationary means representative of such environmental parameter, adjacent said aligning means.

4,310,751

MICROFILM INDEXING MACHINE

Gregory K. Martin, East Detroit, and Alexander Brunner, West Bloomfield, both of Mich., assignors to Visual Systems Corp., Southfield, Mich.

Filed May 7, 1979, Ser. No. 36,754
Int. Cl.³ G06M 3/06
U.S. Cl. 235—92 MP **2 Claims**



1. A microfilm indexing machine for automatically generating an index for a roll of microfilm having document and page markers thereon, comprising:

signal means for providing a first count signal in response to a document marker and a second count signal in response to a page marker;

first counter means for counting said first count signals;

second counter means having a reset input and being adapted for counting said second count signals;

a keyboard for making document identification index entries;

recording means including a printer for recording said entries onto a tangible recording medium; and

microcomputer means for providing a reset signal to the reset input of said second counter means whenever a first count signal is produced by said signal means and being responsive to an index entry made on said keyboard or to the production of a second count signal immediately following an index entry for accessing said first and second counter means and providing to said recording means for recording onto said tangible medium the contents of said first and second counter means such that the document and page address of the document identified by an index entry is automatically recorded onto said recording medium adjacent said identification entry.

4,310,752

ELECTRONIC PRICE CONVERSION AND DISPLAY SYSTEM ADAPTED FOR INSTALLATION ON EXISTING MECHANICAL FLUID DISPENSING PUMPS

Pierre J. R. Boyer, and Jacques J. F. Boyer, both of Pittsburg, Calif., assignors to Boyer & Adcock, Pittsburg, Calif.

Filed Sep. 28, 1979, Ser. No. 80,168
Int. Cl.³ G06M 1/27; B67D 5/22
U.S. Cl. 235—92 PL **8 Claims**

1. In a mechanical fluid dispensing pump having rotatable number display wheels ranging from a lowest order to a highest order number display wheel, wherein said number display wheels register a total price for fluid dispensed during a pumping cycle, a remote electronic price conversion and display system comprising

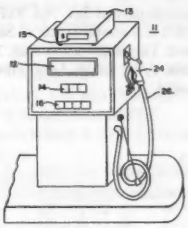
angular position indicators placed around said lowest order number display wheel at preselected intervals,

means mounted within said pump for sensing the passage of said angular position indicators as said indicators are rotated, the response of said sensing means being to generate count pulses corresponding to passage angular position indicators,

first circuit means for providing count information derived from the electrical pulses generated by said photodetection means, said first circuit means having a multiplexed multi-segment output for transmitting count information,

a remote digital price display comprised of individual multi-segment display digits ranging from a lowest order to a highest order display digit,

second circuit means for actuating each multi-segment display digit of said remote price display from the multiplexed multi-segement output of said first circuit means to provide a digital transaction price readout at said remote



price display which correlates with the total number of count pulses generated by said angular position indicators as they rotate past said sensing means, whereby the number, and hence the spacing, of said angular position indicators in relation to the spacing of the numbers imprinted on said lowest order display wheel will determine the conversion between the transaction price as displayed on the pump's mechanical display wheels and the transaction price as displayed on said remote digital display,

said second circuit means including a sequencing circuit for sequencing the multiplexed output of said first circuit means to said individual display digits of said digital price display, said sequencing circuit having logic means for suppressing the multiplexed output from said first circuit means which is sequenced to the higher order display digits of the price display when said higher order digits read "0" whereby said display digits are not actuated until the price indication reaches a level which utilizes such higher order digits, and

means for resetting said remote price display after the completion of a pumping cycle.

4,310,753

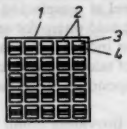
KEY FOR DATA PROCESSING MINIATURE IMPLEMENTS

Janos Fischer, Feldblumenweg 22, Zurich, Switzerland

PCT No. PCT/CH78/00027, § 371 Date Jun. 13, 1979, § 102(e) Date Jun. 13, 1979, PCT Pub. No. WO79/00203, PCT Pub. Date Apr. 19, 1979
PCT Filed Oct. 6, 1978, Ser. No. 112,311
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2731690
Int. Cl.³ G06C 7/02
U.S. Cl. 235—145 R **12 Claims**

1. In a miniaturized data processing data which includes a keyboard that utilizes miniaturized keys located in close side-by-side relationship, the improvement wherein at least one of the miniaturized keys of the keyboard includes an upper surface comprising a first surface portion, a second surface por-

tion and a downwardly-extending wall located between said first surface portion and said second surface portion, said



downwardly-extending wall extending transversely of the key from one side to the other and acting to support the tip of a user's fingernail.

4,310,754

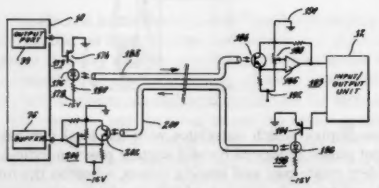
COMMUNICATION MEANS WITH TRANSDUCER PHYSICALLY SPACED FROM INTERIOR WALL OF SECURE HOUSING

Frank T. Check, Jr., Orange, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 918,785, Jun. 26, 1978, abandoned, which is a continuation of Ser. No. 704,998, Jul. 14, 1976, abandoned. This application Aug. 3, 1979, Ser. No. 63,369

Int. Cl.³ G06K *7/10*; G02B *5/14*; H04Q *1/06*; G02B *5/16*

U.S. Cl. 235—454 **18 Claims**



1. A postal meter system comprising a physically secure housing, an interconnected postal printing means and electronic postal accounting system physically enclosed by said housing to secure said printing means and said accounting system from external electrical signals, a peripheral control device disposed remotely from said housing, I/O communication means extending from said peripheral device through a physically secure wall of said housing for interconnecting said accounting system with said peripheral device, comprising said communication means extending into said housing completely through and beyond said wall whereby the internal end thereof is wholly within said housing, and an optical-electric transducer responsive to said communication means and positioned wholly within said housing and physically spaced from the internal wall of said housing at said internal end, said transducer converting optical signals derived from said communication means to electrical signals for application to said accounting system.

4,310,755

ELECTRONIC POSTAGE METER RADIANT ENERGY DEVICE CIRCUIT

Roland G. Miller, New Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 26, 1979, Ser. No. 107,101

Int. Cl.³ H01J *40/14*

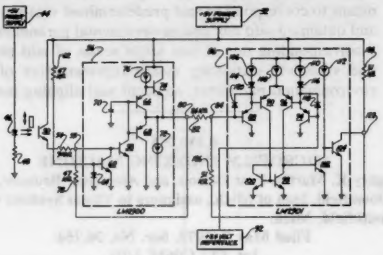
U.S. Cl. 250—214 R **19 Claims**

1. A radiant energy system, comprising:

radiant energy receiving means for receiving radiant energy and converting received radiant energy into electrical signals;

current amplifying means coupled to said radiant energy receiving means;

voltage comparator means coupled to said current amplifying means and providing an output signal; and



information processing means coupled to said voltage comparator means for processing the output signal information from said voltage comparator means.

4,310,756

LIGHT GRID ARRANGEMENT USING CYCLICALLY SWITCHED SEMICONDUCTOR LIGHT SOURCES

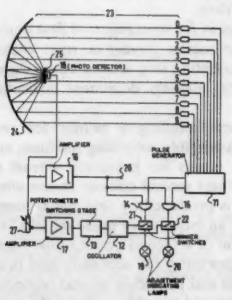
Erwin Sick, Icking, and Günter Fetzer, Gundelfingen, both of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Nov. 23, 1979, Ser. No. 96,959

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1978, 2851444

Int. Cl.³ G01V *9/04*

U.S. Cl. 250—221 **16 Claims**



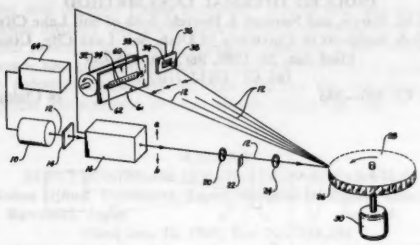
1. A light grid arrangement comprising a row of light emitting semiconductor elements, switching means for periodically and cyclically switching said light emitting semiconductor elements on one after the other, a monitoring region and image forming optical means which receives the light transmitted from the semiconductor elements through the monitoring region and which concentrates this light onto a photodetector, the arrangement further including a slot aperture located at the focal point of said image forming optical means, the slot of said slot aperture extending substantially at right angles to the row of light emitting semiconductor elements, the slot having a width so that the light leaving said light emitting semiconductor elements is trimmed in the direction of the row, whereby only a part of the light beam which is received by the image forming means can reach said photodetector which is arranged behind said slot aperture and which receives all the light passing through said slot.

4,310,757

APPARATUS FOR CORRECTING SCANNING SPEED IN A POLYGON USED FOR LASER SCANNING

Frank T. Check, Jr., Orange, and Ronald P. Sansone, Weston, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Division of Ser. No. 922,596, Jul. 7, 1978, Pat. No. 4,214,157.
This application Mar. 14, 1980, Ser. No. 130,278
Int. Cl.³ H01J 3/14
U.S. Cl. 250—236 2 Claims



1. In a light scanning apparatus comprising means for generating a laser beam, means modulating the amplitude of the beam in accordance with a writing program, a multifaceted reflective polygon positioned in the beam path, means for rotating the polygon, the beam being reflected from successive facets of the polygon and sweeping along a scan path to provide successive raster lines, a photoreceptor positioned to have the raster lines extending thereacross, the improvement comprising means controlling the speed of rotation of the polygon, the control means including sweep velocity measurement means, the sweep velocity measurement means comprising a pair of electro-optical sensing means, one of the sensing means being positioned along the scan path at a fixed reference ahead of the scan format and the other sensing means being positioned along the scan path rearwardly of the photoreceptor, each sensing means comprising at least one photodetector and means providing a signal indicative of the presence of the beam, means receiving the signals of each of the sensing means and in response thereto providing a control signal for changing the speed of rotation of the polygon.

4,310,758

METHOD FOR EVALUATING MOISTURE TENSIONS OF SOILS USING SPECTRAL DATA

John B. Peterson, West Lafayette, Ind., assignor to Purdue Research Foundation, West Lafayette, Ind.

Filed Apr. 10, 1980, Ser. No. 139,027
Int. Cl.³ G01V 5/00; G01J 1/00
U.S. Cl. 250—255 23 Claims

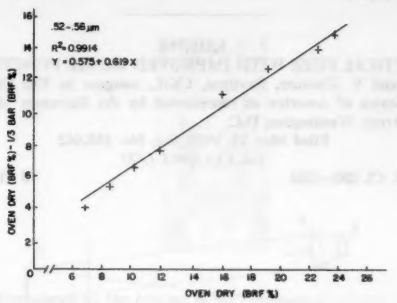
1. A method for evaluating soil moisture tension, said method comprising:

obtaining soil samples;

establishing from said samples the relationships between spectral reflectance values and moisture tension values for said soil samples;

selecting soil having similarities to that of said soil samples for evaluation of moisture tension therein;

determining spectral reflectance values for said selected soil; and



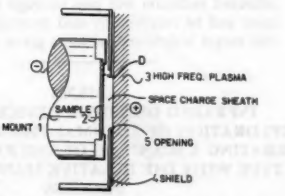
using said determined spectral reflectance values and said established relationships between said values to evaluate soil moisture tension with respect to said selected soil.

4,310,759

SYSTEM FOR REMOVAL OF MATERIAL FROM THE SURFACE OF A SAMPLE

Hans Oechsner, Am Dietrichsberg 9, 3392 Clausthal-Zellerfeld, Fed. Rep. of Germany

Filed Apr. 10, 1980, Ser. No. 139,089
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950329
Int. Cl.³ G01N 23/00
U.S. Cl. 250—309 3 Claims



1. A system for removing material from the surface of a sample comprising: a high-frequency plasma produced in front of the sample surface; a metallic shield disposed between the sample and the high-frequency plasma, electrically insulated from the sample and provided with an aperture determining the sample area to be removed; the parameters of this arrangement are chosen so that the relation

$$U_2=(U_1^{\frac{1}{2}}+D/C)^{4/3}$$

with

$$C=\frac{1}{3}\left(\frac{\epsilon_0}{n}\right)^{\frac{1}{2}}\left(\frac{2}{e_0\cdot kT_e}\right)^{\frac{1}{4}},\ U_1=\frac{kT_e}{2e_0}\ln\frac{M_i}{2\pi m_e}$$

holds, wherein:

U_2=Potential difference applied between sample and plasma;

D=spacing of sample surface from shield;

ϵ_0=dielectric constant of vacuum;

n=density of plasma;

e_0=elementary charge;

k=Boltzmann constant;

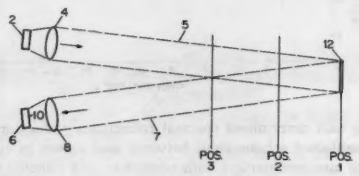
T_e=electron temperature;
M_i=atomic mass of the species of ions (plasma ions) used;
m_e=electron mass; and
π=3.14.

4,310,760

OPTICAL FUZE WITH IMPROVED RANGE FUNCTION

Leland V. Gardner, Buellton, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 27, 1980, Ser. No. 153,462
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—338 **5 Claims**



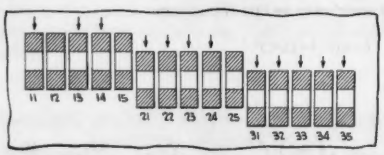
1. An optical device comprising:
a source of radiation;
means for directing said radiation in a beam, through a medium, towards a target space;
receiving means for detecting radiation reflected from a target in said target space;
stop means for limiting radiation reflected from aerosols suspended in said medium from reaching said receiving means;
means for controlling the size of said target space wherein said target space is defined by the ranges at which said reflected radiation will pass through two or more aperatures and be received by said receiving means such that said target is detected within a given set of ranges.

4,310,761

INFRARED DETECTOR DEVICE FOR THE EXPLORATION OF THERMAL IMAGES BY SYSTEMS OPERATING A SCANNING OF THE PARALLEL SERIES TYPE WITH THE RELATIVE MANUFACTURING PROCESS

Marco Fazi, Via Mario fascetti 26, 00136 Roma, and Heinz K. Diedrich, Via Lipari, 1, 00141 Roma, both of Italy

Filed Jun. 18, 1979, Ser. No. 49,509
Claims priority, application Italy, Sep. 15, 1976, 51273 A/76
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—342 **4 Claims**



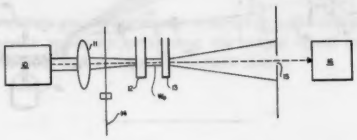
1. An infrared scanner wherein an infrared image is moved relative to infrared detectors in a scanning movement, said improvement comprising:
an array of a plurality of series of infrared detectors, each series made up of "N" infrared detectors where "N" is a positive integer, each series being aligned parallel to the scanning movement, adjacent series being spaced in the direction normal to the scanning movement by an amount equal to a desired distance between two scanning lines, each series having a first detector positioned ahead of the other detectors of that series in the scan direction, the first detectors being offset from one another in the scanning movement direction, the plurality of series comprehending in said normal direction the entire infrared image to permit coverage of said entire image in a single scan in the scanning movement direction.

4,310,762

CALORIMETRIC TRACE ANALYSIS BY LASER INDUCED THERMAL LENS METHOD

Joel M. Harris, and Norman J. Dovichi, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Jan. 28, 1980, Ser. No. 115,733
Int. Cl.³ G01J *1/00*
U.S. Cl. 250—343 **14 Claims**



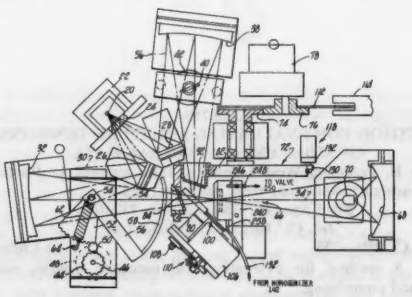
1. A laser powered absorption apparatus comprising:
laser means for generating a beam of radiation;
beam convergence means located in the beam of radiation generated by said laser;
first and second cell means for receiving a sample, said cells located beyond said beam convergence means and in alignment with one another and said beam convergence means so that said beam of converging radiation passes through said first cell and then through said second cell, said cells spaced from one another a predetermined distance;
beam width detection means located beyond said second cell and in alignment with said cells and said convergence means so that radiation passing through said second cell is received by said beam width detection means.

4,310,763

ELECTRO-OPTICAL ANALYZER FOR MEASURING PERCENTAGE BY WEIGHT OF FAT, PROTEIN AND LACTOSE IN MILK

John Shields, 23 North La., Wheldrake Nr. York, England

Filed Oct. 15, 1979, Ser. No. 84,662
Int. Cl.³ G01N *21/26*
U.S. Cl. 250—339 **28 Claims**



1. Apparatus for quantitative analysis of optical characteristics of fluent materials comprising a source of radiation in the infrared spectrum, first means for splitting radiation from said source into first and second convergent beams, a drum disposed to rotate about a fixed axis and having a circumferential

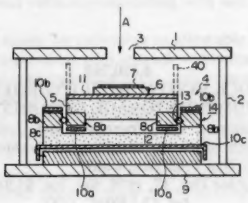
rim portion disposed to intersect one of said beams as said drum is rotated and an axial disc portion disposed to intersect the other of said beams as said drum is rotated, an optically transparent cell aligned with said first beam for holding a test sample, chopper means disposed between said drum and said cell and adapted to alternate between a first position in which said first beam is directed through said cell and a second position in which said second beam is directed through said cell, optical filter means disposed in said disc and rim portions of said drum as to intersect respective ones of said beams such that said chopper means alternately directs first and second beams through said cell at wavelengths corresponding to said filter means in said first and second positions of said chopper means, and energy responsive means disposed to be responsive to radiation transmitted through said cell for indicating an optical characteristic of a test sample within said cell.

4,310,764

ELECTRON BEAM IRRADIATION APPARATUS

Nobuo Iijima, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 11, 1980, Ser. No. 158,356
Claims priority, application Japan, Jun. 12, 1979, 54-72976
Int. Cl.³ G01M *21/00*
U.S. Cl. 250—440 **15 Claims**



1. An electron beam irradiation apparatus comprising:
a base plate of a magnetically permeable material;
a movable stage mounted on said base plate;
an upper magnetic shield plate disposed above said stage and having an electron beam passage hole formed therethrough;
side members of high magnetic permeability which magnetically interconnect said base plate and said upper shield plate; and
a magnetic shield cover plate which covers the table surface of said stage.

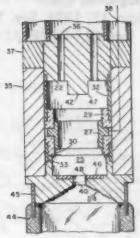
4,310,765

NEUTRON ACCELERATOR TUBE HAVING IMPROVED IONIZATION SECTION

Wyatt W. Givens, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1980, Ser. No. 145,928
Int. Cl.³ G21G *4/02*
U.S. Cl. 250—493 **6 Claims**

1. In a sealed neutron accelerator tube having a target and a spaced replenisher section for supplying accelerator gas, an ionization section located between said target section and said replenisher section comprising:
(a) means forming an ionization chamber in said tube adapted to receive accelerator gas from said replenisher section,
(b) first and second cathodes spaced from one another and having opposed active surfaces exposed to the interior of said chamber,
(c) anode means located at a position intermediate of said cathodes whereby in response to an applied positive voltage electrons created by field emission are transmitted between the opposed active surfaces of said cathodes and produce the emission of secondary electrons upon impacting an active cathode surface, and
(d) the active surface of at least one of said cathodes being



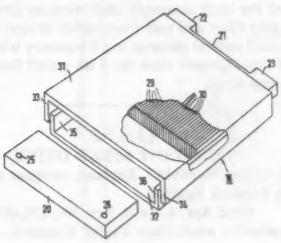
formulated by the heating in the presence of oxygen of a material having a secondary electron emission factor of at least 2, and said active surface is at least two atom layers in thickness.

4,310,766

MOTOR DRIVEN X-RAY GRID AND FILM-HOLDER ASSEMBLY

Joahnn Finkenzeller, and Günter Holzermer, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 15, 1979, Ser. No. 66,848
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1978, 2838901
Int. Cl.³ A61B *6/00*
U.S. Cl. 250—509 **10 Claims**



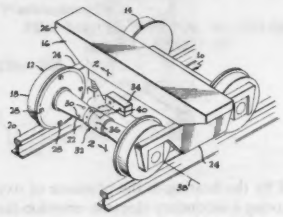
1. An x-ray grid and cassette mounting assembly for an x-ray examination apparatus, comprising a housing with receiving means for receiving a cassette holder, and grid guide means, a stray radiation grid for guidance by said grid guide means, and motor drive means for effecting movement of the stray radiation grid along said grid guide means, characterized in the stray radiation grid (16) having at respective sides thereof respective guide section (20, 21), the motor drive means comprising a motor drive (17) and a support mounting part (19) driven thereby, the guide section (20) at one of the sides of said grid being positionable in positive locking engagement with the support mounting part (19) of the motor drive means (17, 19), and the guide section (21) at the other side of said grid being displaceable in said grid guide means (24) of the housing (3), and further characterized in the grid (16) having metal plates (31, 32) with inturned edges to define U-shaped configurations, and having spaced lamellae (29) cemented betweer. said metal plates (31, 32), the plates (31, 32) providing respective laterally directed open sides receiving the respective guide sections (20, 21), and said guide sections being secured with said metal plates (31, 32), to effectively enclose said lamellae (29) on all sides thereof.

4,310,767

DATA INTERFACE BETWEEN ROTATING AND NONROTATING MEMBERS

Richard A. Peacock, Colorado Springs, Colo., assignor to Wyle Laboratories, El Segundo, Calif.

Filed Apr. 11, 1979, Ser. No. 29,050
Int. Cl.[3] G02B 27/00
U.S. Cl. 250—551 10 Claims



1. A data transmission system for use in an assembly which includes a frame and an axle rotatably mounted on the frame, and which also includes at least one transducer circuit on the axle for generating a signal, and a signal processing circuit on the frame, comprising:

an optical transmitter device having an input connected to said transducer circuit and mounted on said axle, said transmitter device having at least one light emitting optical element; and

an optical receiver deivde having an output connected to said processing circuit and mounted on said frame opposite said transmitter device, said receiver device having at least one light sensitive optical element;

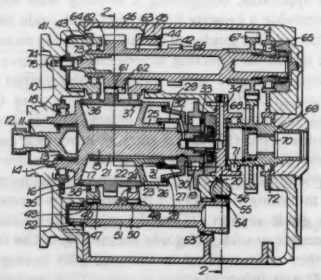
said transmitter device including a plurality of light emitting optical elements angularly spaced about the axis of rotation of the shaft assembly, said receiver device forming a high pass filter and said transmitter device constructed to drive said optical element at a frequency which is a plurality of times greater than the 3 db cutoff frequency of said high pass filter.

4,310,768

CONSTANT SPEED DRIVE

Rowan H. Colley, Sunnyhill, England, assignor to Rolls-Royce Limited, London, England

Filed Apr. 1, 1980, Ser. No. 136,401
Claims priority, application United Kingdom, Apr. 21, 1979, 13959/79
Int. Cl.[3] F16H 15/22; H02K 7/10; H02P 9/04
U.S. Cl. 290—1 C 8 Claims



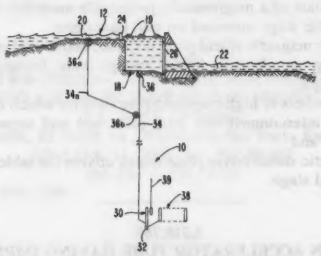
1. A constant speed drive comprising a variable ratio drive transmission including two spaced rotatable discs having facing frusto-conical surfaces and having a common axis, a rotatable annulus having an axis parallel to the axis of said discs and having opposite facing frusto-conical edges respectively engaging the frusto-conical surfaces of said discs, hydraulically actuated loading means for urging said discs toward one another to provide a frictional drive between said discs and said annulus in accordance with torque of the drive, actuation means for moving said annulus relative to said discs between a position in which the axis of said annulus is coaxial with the axis of said disc to provide a unity drive ratio and a position in which the axis of said annulus is still parallel to but spaced from the axis of said discs to provide a different ratio determined by spacing between the axes, and a hydraulic control means for controlling said actuation means to vary the relative positions of the axes of said discs and annulus and thus the drive ratio to maintain a sensibly constant output speed, said hydraulic control means being operated in accordance with output of said drive, said hydraulic control means coacting with said hydraulically actuated loading means to provide a compensating effect between the output of a particular drive ratio and the frictional drive between said discs and annulus.

4,310,769

SHIP LOCK SYSTEM WITH HYDROELECTRIC PUMPED-STORAGE CAPABILITY

Frank L. Mazzone, San Francisco, and Joseph E. Tegda, Moraga, both of Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Filed Oct. 17, 1979, Ser. No. 85,848
Int. Cl.[3] E02C 1/00
U.S. Cl. 290—54 13 Claims

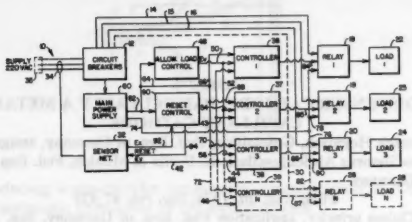


1. A system for generating electrical power comprising: a ship lock for connecting two bodies of water at different water levels, the ship lock having a pair of spaced gates for permitting passage of ships to and from the ship lock when the gates are alternately opened and closed; an underground pumped-storage unit having a reversible pump-turbine and a reservoir for placement at depth beneath the ship lock and for generating electrical power, said reservoir being spaced from said bodies of water; and penstock means coupling the ship lock with the pumped-storage unit for directing water from the ship lock through the unit to cause electrical power to be generated as a function of the flow of water from the ship lock to the reservoir, said penstock means being operable to permit water to be pumped upwardly by the pumped-storage unit from the reservoir to the ship lock, whereby there will be substantially no net consumption of water in the operation of the ship lock and the pumped-storage unit.

4,310,770
DEMAND LOAD CONTROL

Harold M. Keener, Ashland, and Michael J. Sciarini, Dover, both of Ohio, assignors to Ohio Agricultural Research and Development Center, Wooster, Ohio

Filed Dec. 3, 1980, Ser. No. 212,455
Int. Cl.³ G05B 6/02
U.S. Cl. 307—35 **18 Claims**



1. A system for selectively shedding electrical loads from a power input in accordance with a predetermined priority basis when the demand load value exhibited at said power input exceeds an allowable load vale, comprising:

sensor means having an output signal, when activated, of instantaneous value corresponding with said demand load value;

load control means for providing an allowable load signal of value corresponding with said allowable load value and

a plurality of load switching units each connectable with a different load and each comprising a controller means and a switching means, each of said controller means having a receiving network, a priority delay network deriving an actuating output condition when enabled and following a priority interval selected in correspondence with the predetermined priority basis of its associated load, and actuator network means responsive to said actuating output condition for deriving a shedding signal, said receiving network having a first input for receiving said sensor means output signal and a second input for receiving said allowable load signal and deriving an output condition enabling said priority delay network when the signal value at said first input is greater than the signal value at said second input; and feedback circuit means responsive to said shedding signal for deriving a fictitious load signal of value substantially corresponding to its associated load and asserting said fictitious load signal at said receiving network first input of that controller means but not at the receiving network first input of any other controller means, and each of said switching means being connectable with its associated load and with said power output and responsive to said shedding signal supplied by its associated controller means for disconnecting its associated load from said power input.

4,310,771
METHOD FOR TRANSFERRING POWER IN A SYNCHRONOUS MODE TO A MOTOR BUS

Michael A. Wyatt, Tampa, and Robert W. Beckwith, Seminole, both of Fla., assignors to Beckwith Electric Co., Inc., Largo, Fla.

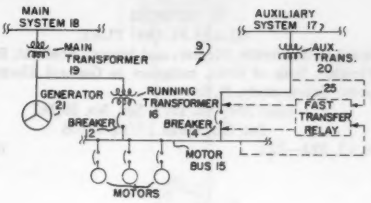
Continuation-in-part of Ser. No. 37,680, May 10, 1979, Pat. No. 4,256,972. This application May 10, 1979, Ser. No. 37,703
The portion of the term of this patent subsequent to Mar. 17, 1998, has been disclaimed.
Int. Cl.³ H02J 9/06, 3/08
U.S. Cl. 307—64 **2 Claims**

1. A method for coupling power to a motor bus through a circuit breaker from an awxiliary power system which motor bus has a residual voltage thereon, said method consisting of the steps of:

(a) sensing the frequency of the voltage of said auxiliary system;

(b) sensing the frequency of the voltage of said motor bus;

(c) measuring the phase difference between the voltage on the auxiliary system and the voltage on the motor bus;



(d) obtaining the rate of change of the phase difference;

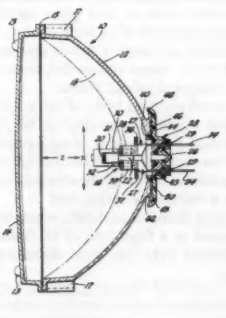
(e) obtaining the phase difference acceleration;

(f) comparing the phase difference, the rate of change of the phase difference and the phase difference acceleration to obtain a prediction of zero phase difference.

4,310,772
SEALED BEAM LAMP AND METHOD OF MANUFACTURE

David O. Tyler, Anderson, and George M. Gasparovic, Pendleton, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 26, 1979, Ser. No. 97,363
Int. Cl.³ H01K 1/46, 3/06
U.S. Cl. 313—113 **3 Claims**



1. In a sealed beam lamp comprising a reflector having a concave surface, a bulb supported in front of said reflector by the lamp terminals to which the bulb lead-in wires are secured to form a light source assembly, said reflector having a light controlling lens sealing its forward end and having a central opening formed in its rearward end, the invention comprising an annular boss provided about said opening on the outer surface of said member and extending rearwardly therefrom to form a rearward facing seating surface, a terminal socket seated on said surface in sealed relationship therewith, said terminal socket having a center portion through which at least two lamp terminals extend, said terminals being secured to and sealed within said socket by a sealing cement, an annular rim extending outward from and integrally formed with the center portion of said socket and having an integrally formed forward extending lip portion on the entire rim periphery, and a sealing cement between the adjacent seating surface of said boss and the forward facing surface of said rim to provide a gas-tight seal, the width of said rim being greater than the width of the seating surface of said boss to enable free sliding movement therebetween for adjustment of bulb filament position with

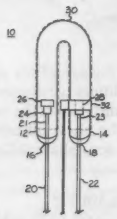
respect to the reflector in the up-down and sideways directions, the light source assembly being adjusted in the longitudinal direction by the forward and backward movement of the terminals, all adjustments being made prior to the setting of said cement.

4,310,773

GLASS FLASH TUBE

Edward C. Zukowski, Mentor, and John C. Sobieski, Richmond Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 16, 1979, Ser. No. 39,265
Int. Cl.³ H01J *17/16, 17/06*
U.S. Cl. 313—221 **10 Claims**



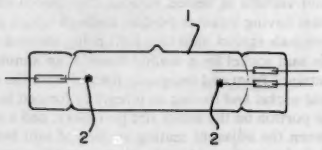
1. A flash tube which comprises:
(a) an elongated closed tube of borosilicate glass having the following constituents in about the range stated by weight: 60–75% SiO_2, 10–25% B_2O_3, 1–10% Al_2O_3, 4–10% total alkali oxide, and 0–5% BaO, except for incidental impurities and residual fluxes and refining agents,
(b) electrical inlead wires sealed directly by hermetic seal at the outer ends to said glass material, said inlead wires being composed of an alloy of iron, nickel, and cobalt, and optionally containing minor amounts of manganese,
(c) refractory metal electrodes secured to the inner ends of said electrical inlead wires,
(d) a porous sintered body of refractory metal secured to one of said electrodes having an electron emissive material dispersed in the pores of said porous sintered body, said electron emissive material being an interoxide of at least one alkaline earth metal selected from calcium and barium with a refractory metal, and
(e) a xenon filling in said tube whereby said flash tube can be operated at a flash rate of 60 flashes per minute without significant light loss from discoloration or crazing of the glass.

4,310,774

ARC DISCHARGE LAMP CONTAINING SCANDIUM AND SCANDIUM HALIDE

Robert J. Karlotski, Weare, N.H., and Dale E. Work, Topsfield, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 3, 1980, Ser. No. 126,780
Int. Cl.³ H01J *61/18*
U.S. Cl. 313—228 **1 Claim**



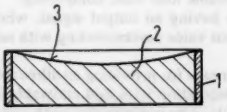
1. A metal halide arc discharge lamp comprising an arc tube having electrodes at its ends and containing a fill including mercury, a starting gas, elemental scandium, scandium halide and sodium halide, the quantity of scandium halide being a least 2.6×10^{-6} gram atoms per centimeter of arc length, the quantity of sodium halide being at least 3.0×10^{-5} gram atoms per centimeter of arc length, the voltage rise of the lamp after 4000 hours of normal operation being less than 20 volts.

4,310,775

DISPENSER CATHODE, PARTICULARLY A METAL CAPILLARY CATHODE

Hinrich Heynisch, Graefelfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 20, 1979, Ser. No. 67,925
Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2842079
Int. Cl.³ H01J *1/14, 19/06;* H01K *1/04*
U.S. Cl. 313—346 R **4 Claims**



1. A dispenser cathode, particularly a metal capillary cathode, for electric discharge vessels with an emission substance carrier disk (2) that is porous on the front face to provide an outer, active surface (3), and that comprises a metal, such as tungsten, melting at a high temperature, the emission substance carrier disk (2) having a nonporous outer casing surface (1) with an electron work function that is higher than that of the outer, active surface (3) of the emission substance carrier disk (2), said outer casing surface (1) being in the form of a thin-walled cylinder which has a wall thickness in the range from about five to ten microns, said outer casing surface (1) of the emission substance carrier disk (2) having an electron work function of greater than four electron volts, the outer, active surface (3) of the emission substance carrier disk (2) having an electron work function of approximately two electron volts, and said emission substance carrier disk (2) being laterally enclosed by said nonporous outer casing surface of thickness not greater than ten microns such that practically no electrons are emitted from the cathode laterally of the carrier disk (2) at an optimum operating temperature for the dispenser cathode.

4,310,776

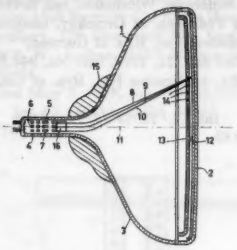
CATHODE-RAY TUBE

Andreas M. W. Duys, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 15, 1979, Ser. No. 94,404
Claims priority, application Netherlands, Dec. 27, 1978, 7812540
Int. Cl.³ H01J *29/50*
U.S. Cl. 313—414 **8 Claims**

1. A cathode-ray tube comprising an evacuated envelope including an electron gun for generating an electron beam which is focused on a target, said electron gun comprising, centred along an axis, a cathode, a grid having an aperture, and

a first anode having an aperture, characterized in that permanent magnet means is provided in the vicinity of the grid for



producing a non-circular symmetrical magnetic field to effect an astigmatic cross-over of the electron beam.

4,310,777

DIRECTLY HEATED CATHODE FOR ELECTRON TUBE

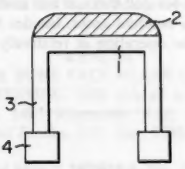
Hiroshi Fukushima, Chiba; Ko Soeno; Hisashi Ando, both of Hitachi; Shigehiko Yamamoto, Tokorozawa, and Toshiyuki Aida, Chofu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 10, 1980, Ser. No. 110,920

Claims priority, application Japan, Jan. 19, 1979, 54-3955

Int. Cl.³ H01J *1/14*

U.S. Cl. 313—345 **7 Claims**



1. A directly heated cathode for an electron tube comprising a base plate made of an alloy containing 20 to 30% by weight of W, 0.12 to 0.28% by weight of Zr and the remainder being Ni and an electron emissive oxide layer disposed directly on the base plate.

4,310,778

TELEVISION CAMERA TUBE WITH ANTIHALO PLATE

Jan Horseling, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

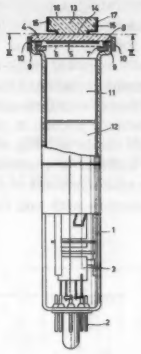
Filed May 8, 1980, Ser. No. 147,894

Claims priority, application Netherlands, Jun. 19, 1979, 7904754

Int. Cl.³ H01J *29/89, 31/26*

U.S. Cl. 313—371 **5 Claims**

1. A television camera tube comprising in one end of an evacuated tubular envelope an electron gun for generating an electron beam which, when deflected, describes a frame on a photoconductive target provided at the inside of a window closing the other end of the envelope, the outside of the window having an antihalo plate provided thereon, said plate including a peripheral surface adapted for reduced light reflection, characterized in that a contact surface of the plate and the window is smaller than an entrance face of the plate situated



opposite to and parallel to the contact surface, and the frame, viewed through the plate, falls within the contact surface.

4,310,779

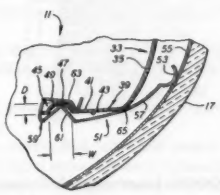
CATHODE RAY TUBE SHIELD-FUNNEL CONNECTIVE MEANS

Carl W. Penird, Waterloo, and Peter G. Puhak, Seneca Falls, both of N.Y., assignors to North American Philips Consumer Electronics Corporation, New York, N.Y.

Filed Jan. 28, 1980, Ser. No. 116,367

Int. Cl.³ H01J *29/06, 29/02*

U.S. Cl. 313—407 **5 Claims**



1. An improvement in a cathode ray tube having a longitudinal axis therethrough and an internal magnetic shielding member spatially disposed substantially within the envelope funnel portion thereof, said shielding member evidencing a continuous contoured bowl-like sidewall enclosure with front and rear openings discretely formed therein, said rear shield opening being defined by the terminal periphery of a continuous instanding ledge element extending inward from said sidewall toward said axis, said ledge constituting the rearward surrounding border portion of said shield, having a forwardly oriented alpha surface and a rearwardly oriented beta surface said improvement being combination connective means for effecting electrical connection between said shielding member and the adjacent conductive coating disposed on the interior surface of said encompassing funnel portion, said combination means comprising:

a narrow open-channel fluting formed in the bordering ledge element of said shield adjacent the terminal periphery thereof, the sectional configuration of said fluting evidencing defined width and depth thereby producing a forward-effected rib-like protrusion from the alpha surface of said ledge and an opposed open-channel counter formation facing rearward from the beta surface of said ledge; and

a substantially longitudinal metallic contactor member

formed of an integration of a discretely configurated resilient attachment element, an opposed contact element and an intermediate flexural element; said attachment element incorporating a protuberance portion having a defined slope and height formed to substantially seat in the open-channel formation of said fluting and an intergral and substantially opposed hook-like portion shaped as a fold-back formation positioned to concomitantly clasp the rib-like protrusion of said fluting thereby effecting locking of said protuberance portion in positive seated placement in said channel, thusly affixing said contactor member to said shielding member in a manner to orient said integral flexural and contact elements in a position to consummate electrical connection with said funnel-disposed coating.

4,310,780

MAGNETIC FOCUSING STRUCTURE FOR THREE IN-LINE GUN TYPE COLOR PICTURE TUBES

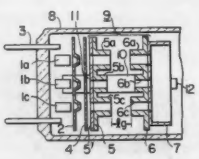
Soichi Sakurai; Kyohei Fukuda, both of Mobara, and Masanobu Takata, Ichimiyamachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 6, 1979, Ser. No. 72,913

Claims priority, application Japan, Sep. 6, 1978, 53-108654

Int. Cl.³ H01J *29/51*

U.S. Cl. 313—412 **22 Claims**



1. In an electron beam magnetic focusing lens structure for a three in-line gun color picture tube, having means for generating magnetic fields and a pair of mutually-opposed plate-like magnetic pole pieces made of magnetic material having high magnetic permeability, said pair of magnetic pole pieces having beam-passing in-line through-holes and being disposed opposite to each other and perpendicular to the axis of the tube, for controlling focusing magnetic fields generated by said magnetic field generating means for center and side electron beams in such a manner that said beams converge near the phosphor screen and are focused respectively on said phosphor screen, said magnetic field generating means being disposed with respect to said pair of pole pieces so that magnetic focusing lenses are formed between mutually-opposed through-holes thereof, the improvement wherein at least one of said pole pieces is provided with cylindrical magnetic members extending coaxially from said through-holes toward the opposite pole piece, said magnetic members having differential axial lengths so that the gap length between the mutually-opposed pole pieces for the center beam is different from the gap lengths between the mutually-opposed pole pieces for the side beams, the inner walls of the through-hole and the inner surface of the cylindrical magnetic member establishing a magnetic pole upon magnetization by said field generating means, to thereby equalize the respective focusing fields for the respective electron beams established between the mutually-opposed pole pieces.

4,310,781

CONTROLLABLE HYDROGEN SOURCE WITH GETTERING EFFECT FOR ELECTRONIC TUBES

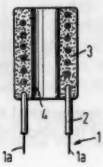
Peter-Wilhelm Steinhage, Wiesbaden, and Roland Heinz, Wallbach, both of Fed. Rep. of Germany, assignors to Heimann GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,581

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1977, 2744146

Int. Cl.³ H01J *19/70, 61/24*

U.S. Cl. 313—180 **10 Claims**



1. In a controllable hydrogen source for insertion in an electronic tube having a heating means and hydrogen as a supporting gas, along with a body containing a metal hydride which is associated with said heating means so that such body releases a temperature-dependent amount of hydrogen when heated, the improvement comprising wherein:

said body is composed of a sintered mixture of zirconium and carbon, which are per se known as gettering materials, said body being charged with hydrogen so as to contain zirconium hydride therein whereby heating of said body releases a temperature-dependent quantity of hydrogen and any residual gases bonded onto said sintered mixture remain bonded thereon and said sintered mixture binds any other residual gases, besides hydrogen, generated during tube operation at relatively higher temperatures.

4,310,782

LAMP FILAMENT SUPPORT

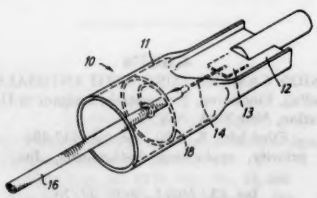
Peter Owen, and John M. Rees, both of Merthyr Tydfil, Wales, assignors to Thorn EMI Limited, London, England

Filed Feb. 8, 1980, Ser. No. 119,874

Claims priority, application United Kingdom, Feb. 9, 1979, 04625/79

Int. Cl.³ H01J *1/88, 19/42;* **H01K** *1/18*

U.S. Cl. 313—271 **10 Claims**



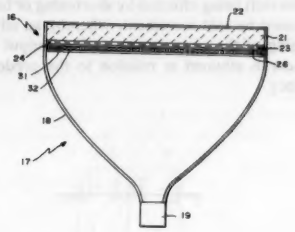
1. In a support for a linear incandescent lamp filament, the support comprising a loop or spiral structure adapted to fit within and against the inner wall of a lamp envelope and to support the filament along its length spaced from said inner wall, the improvement comprising forming said support from a core length of tungsten wire and a coil of further tungsten wire overwound on said core.

4,310,783

CATHODE RAY TUBE FACE PLATE CONSTRUCTION FOR SUPPRESSING THE HALO HAVING A LOW REFLECTION AND METHOD

Michael D. Temple, 1520 Sunview Ct., Santa Rosa, Calif. 95401; James D. Rancourt, 129 Sherwood Dr., Santa Rosa, Calif. 95405, and Erik W. Anthon, 1487 Manzanita Ave., Santa Rosa, Calif. 95404

Filed May 7, 1979, Ser. No. 36,495
Int. Cl.³ H01J 29/28, 29/89
U.S. Cl. 313—474 15 Claims



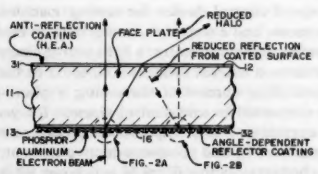
1. In a cathode ray tube face plate construction for suppressing the halo on the face plate of the cathode ray tube, a face plate formed of glass having an index of refraction in the range of 1.45 to 1.75 and having outer and inner surfaces, a fluorescent phosphor screen carried by the inner surface, and an absorbing filter carried by the inner surface of the face plate disposed between the phosphor screen and the inner surface of the face plate, said absorbing filter being comprised of a plurality of metal dielectric periods, each period being comprised of two layers with one of the layers being formed of a dielectric and with the other of the layers being formed of a metal.

4,310,784

CATHODE RAY TUBE FACE PLATE CONSTRUCTION FOR SUPPRESSING THE HALO AND METHOD

Erik W. Anthon, 1487 Manzanita Ave., Santa Rosa, Calif. 95404, and Carol Jacobs, P.O. Box 2383, Santa Rosa, Calif. 95405

Filed May 7, 1979, Ser. No. 36,324
Int. Cl.³ H01J 29/18, 29/89
U.S. Cl. 313—474 6 Claims



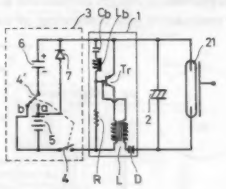
1. In a cathode ray tube face plate construction for suppressing the halo on the cathode ray tube, a face plate formed of glass having outside and inside surfaces, a fluorescent phosphor screen carried by the inside surface and an anti-reflection coating carried by the outside surface of the face plate to reduce reflection from the outside surface of the face plate to suppress the central portion of the halo and an angle sensitive interference coating carried by the inside surface of the face plate for suppressing the outer ring-like portion of the halo and being disposed between the phosphor screen and the inside surface of the face plate, the coating having low reflectance and high transmission at the dominant wavelength of the phosphor, said angle sensitive interference coating having high transmittance for light emitted by the phosphor at near normal angles of incidence and high reflectance at high angles of incidence and creating a shift towards shorter wavelengths at high angles of incidence whereby light emitted at high angles of incidence by the phosphor is reflected to thereby suppress the outer ring-like portion of the halo.

4,310,785

ELECTRONIC PHOTOGRAPHIC FLASH APPARATUS

Hiroshi Iwata, Nara, Japan, assignor to West Electric Company, Ltd., Osaka, Japan

Filed May 15, 1980, Ser. No. 149,986
Claims priority, application Japan, May 29, 1979, 54-66482
Int. Cl.³ H05B 41/32
U.S. Cl. 315—241 P 10 Claims



1. In an electronic photographic flash apparatus comprising
a DC low voltage source,
a DC-DC converter for generating a DC high tension utilizing a DC low tension fed by said DC low voltage source,
a power switch which switches feeding of current from said DC low voltage source to said DC-DC converter,
a high tension capacitor for storing electric energy produced by said DC-DC converter, and
a gas-discharge flash tube for generating a light flash by consuming the electric energy stored in said high tension capacitor,
the improvement is that the apparatus further comprises:
a low tension capacitor to be charged by said DC low voltage source,
an inverse charging prevention device connected to said low tension capacitor,
a switching circuit interlocked with said power switch to attain a first state and a second state of connection of said low tension capacitor with respect to said DC low voltage source, respectively for off and on of said power switch,
said first state being a connection to charge said low tension capacitor by said DC low voltage source, and
said second state having a series connection of said low tension capacitor and said DC low voltage source each other connected to said DC-DC converter and also having a series connection of said DC low voltage source and said inverse charging prevention device connected to said DC-DC converter.

4,310,786

MAGNETRON TUBE WITH IMPROVED LOW COST STRUCTURE

Beverly D. Kumpfer, deceased, late of Salt Lake City, Utah, and Mary Belle Krumpfer, executrix, 4335 Spruce Cir., Salt Lake City, Utah 84117

Filed Sep. 12, 1979, Ser. No. 74,670
Int. Cl.³ H01J 25/50
U.S. Cl. 315—39.51 10 Claims

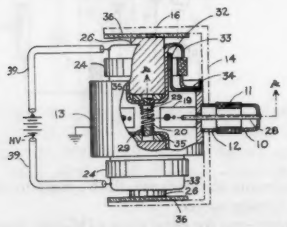
1. A magnetron for the generation of microwave oscillations comprising:
a multicavity cylindrical anode structure;
end closures at both ends of said anode structure and insulated therefrom consisting of re-entrant, closed-ended hollow sections defining a vacuum enclosure;
an electron source consisting of a helical metallic filament

coaxial with said cylindrical anode structure and connected at both ends by means of cylindrical metallic support members affixed to or integral with the inside flat surfaces of said re-entrant end closures;

electrical conductors connected to each of said end closures for the purpose of heating said filament to electron emitting temperature by passing an electrical current therethrough and for rendering said end closures and said filament at high negative potential with respect to said anode structure;

output means consisting of a coaxial transmission line connected between said anode structure and one or more anode resonators and having its center conductor terminated in an antenna with its axis perpendicular to the axis of said anode structure;

mode suppression means connected to alternate sets of alternate resonators and consisting of metallic conductors;



magnets adjacent to said end closures configured to produce a magnetic field in the interaction space between said anode and said filament in a direction parallel to the axis of said anode and said filament and at the same electrical potential as said filament;

microwave leakage suppression means consisting of coaxial choke sections of predetermined length relative to the operating frequency of said magnetron supported by said anode structure and surrounding said re-entrant portions of both end closures in close proximity;

a magnetic return path for guiding magnetic flux lines from the outer extremity of the first said magnet to the outer extremity of the second said magnet and insulated therefrom;

cooling means in thermal contact with said cylindrical anode outer surface.

4,310,787

PHASE-CONTROL DEVICE FOR SYNCHRONOUS MOTORS

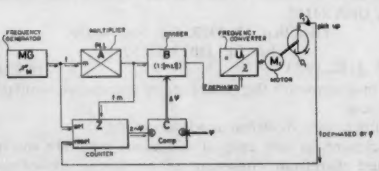
Arnold Seeger; Wilfried Schalt, both of Herzogenrath, and Jürgen Räbiger, Duren, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Dec. 21, 1979, Ser. No. 105,974

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856012

Int. Cl.³ H02P 5/52

U.S. Cl. 318—85 **10 Claims**



1. A device for controlling phase shift of a pulse train having a given frequency by a phase angle ϕ remaining constant even when the frequency is changing, comprising:

a fixed-value frequency multiplier having a predetermined product modulus, said multiplier being fed by the pulse train for increasing the frequency thereof by a factor equal to said modulus;

a frequency divider having a quotient modulus generally equal to said product modulus and being fed by the output of the frequency multiplier; and

means for modifying the quotient modulus cycle by cycle with respect to the product modulus by an increment, the phase shift being effected by shortening or lengthening the quotient by said increment, whereby an advancement or lagging of the phase position of an output signal of said divider is attained in relation to the predetermined frequency.

4,310,788

SPEED CONTROL DEVICE OF SEWING MACHINES

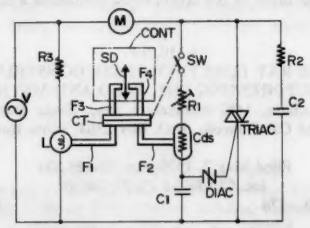
Susumu Hanyu, and Yoshinobu Tonomura, both of Hachioji, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed May 15, 1980, Ser. No. 150,173

Claims priority, application Japan, May 23, 1979, 54-62583

Int. Cl.³ H02P 5/16

U.S. Cl. 318—551 **4 Claims**



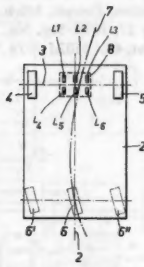
1. A speed control device for sewing machines having a machine motor and a step plate, comprising an electric power source connected to the motor; a light source connected to the power source; a control element connected to the motor for phase-controlling current of the motor; a photo-conductive element connected to said control element for generating an ignition current therein in response to a predetermined amount of light received by said photo-conductive element; two sets of flexible photo-conductive fibers of which one set is adapted to receive light from said light source and the other set is adapted to transmit the light to said photo-conductive element, said sets of said photo-conductive fibers being provided with end portions, the end portions of one set being optically positioned opposite the other set of said photo-conductive fibers to receive light from one another; and a light interrupting plate positioned between the end portions of said sets and secured to said step plate, said light interrupting plate being adapted to be reciprocally moved by said step plate between the end portions of said one set and the end portions of said other set for optically interrupting the light to be passed therebetween and thereby controlling the amount of photo-conduction received by said photo-conductive element due to the light receiving amount, whereby said control element actuates the machine motor in a sense of changing the speed of said motor.

4,310,789

VEHICLE WHICH IS STEERABLE ALONG A GUIDE WIRE LYING IN THE GROUND

Klaus-Dieter Mank, Norderstedt, and Günther Prömmel, Kisdorf, both of Fed. Rep. of Germany, assignors to Jungheinrich Unternehmensverwaltung KG, Hamburg, Fed. Rep. of Germany

Filed Apr. 15, 1980, Ser. No. 140,479
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1979, 2941507
Int. Cl.³ G05D 1/00
U.S. Cl. 318—587 14 Claims



1. In a vehicle comprising steerable wheel means, position control means for controlling the position of said steerable wheel means to steer the vehicle in response to a position control signal, and a system for generating said position control signal so as to steer the vehicle along a signal-emitting guide wire lying in the ground, said system comprising a sensor array including first and second pick-ups which are fixed to the vehicle and aligned with each other in the longitudinal direction of the vehicle and extend each on both sides of the longitudinal center line of the vehicle and are adapted to generate pick-up signals in response to signals emitted by said guide wire, said system further comprising first and second signal-processing circuits respectively connected to said first and second pick-ups to receive said pick-up signals therefrom, said first signal-processing circuit being arranged to generate a heading signal representing the heading angle between the longitudinal center line of the vehicle and the general direction of a portion of said guide wire near said sensor array in response to said pick-up signals from said first pick-up, said second signal-processing circuit being arranged to generate a displacement signal representing the lateral displacement of the longitudinal center line of the vehicle near said sensor from said guide wire, said system further comprising a signal-combining circuit, which is adapted to receive and combine said heading and displacement signals and to generate said position control signal in dependence on said heading and displacement signals

the improvement which resides in that

said sensor array extends only over a small fraction of the length of said vehicle,

said system comprises a curvature detector arranged to generate a curvature signal representing the curvature of a bend of said guide wire near said sensor array, and

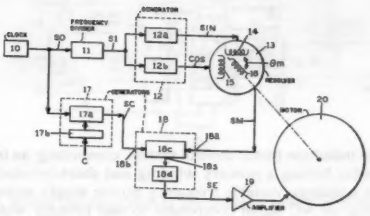
said signal-combining circuit is arranged to generate said position control signal in dependence on said heading, displacement and curvature signals when said vehicle is traveling along a bend of said guide wire.

4,310,790

DEVICE FOR POSITION CONTROL

Yves Mulet-Marquis, Avrille, France, assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Sep. 26, 1979, Ser. No. 78,946
Claims priority, application France, Oct. 5, 1978, 7828539
Int. Cl.³ G05B 1/01
U.S. Cl. 318—608 4 Claims



1. A control device comprising:

a first generator delivering a first and second identical signals, dephased with respect to each other by 90°;

an angular position pickup of the resolver type, having a rotor coupled to a component part whose angular position is to be controlled, said positioning pickup having two inputs connected to said first generator for receiving said first and second signals, respectively, and an output for delivering a measurement signal whose phase is representative of the actual angular position of said component;

a second generator for receiving a digital instruction message in the form of a binary word and for delivering an instruction signal of the same frequency as the first and second signals and having a phase representative of the desired angular position of said component;

a deviation signal generator connected to the output of said angular position pickup and to said second generator for delivering a deviation signal representative of the dephasing between the measurement signal and the instruction signal, said deviation signal generator comprises a synchronous demodulator for receiving a control signal of frequency equal to that of said instruction signal and in phase with the latter, and made up of rectangular pulses of duration equal to one-half of their cycle, so that, in the course of successive half-cycles of the control signal, the gain between an input of the demodulator receiving the measurement signal and an output of the demodulator linked to the output of the deviation signal generator will pass from a positive value to the opposite negative value; and

a control device for controlling the angular position of said component as a function of the deviation signal, characterized by the fact that;

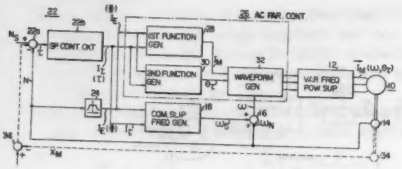
each one of said first and second signals generated by said first generator is a digital approximation of a sinusoidal signal consisting of alternating cycles, each alternating cycle comprising several stages for producing a reduced rate of harmonics,

said deviation signal generator compares directly the phase of the unfiltered output signal from said pickup with the phase of said instruction signal.

4,310,791
INDUCTION MOTOR CONTROL SYSTEM

Masahiko Akamatsu, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 873,663, Jan. 30, 1978, abandoned. This application Apr. 17, 1980, Ser. No. 141,214
Claims priority, application Japan, Feb. 1, 1977, 52-10369
Int. Cl.³ H02P 5/34, 7/42
U.S. Cl. 318—800 5 Claims

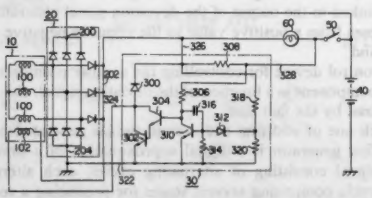


1. An induction motor control system, comprising: an induction motor having a primary winding and shortcircuited secondary windings; variable frequency power supply means for supplying an AC signal component to said primary winding, said variable frequency power supply means including a power source and a power converter comprised of solid state switching elements responsive to control signals for controlling conduction of said solid state switching elements; control signal generating means responsive to external signals for generating the control signals for controlling the conduction of said solid state switching elements; speed control means responsive to a command speed input signal for generating a command torque signal; first function generating means responsive to the command torque signal for generating a first command signal corresponding to an amplitude of the AC signal component; second function generating means responsive to the command torque signal for generating a second command signal corresponding to a phase shift angle of the AC signal component; speed sensing means for sensing a speed of said induction motor and for developing a speed signal representative of motor speed; slip frequency control means responsive to the speed signal and the command torque signal for generating a command frequency signal corresponding to a frequency of the AC signal component; and means for supplying the first command signal, the second command signal and the command frequency signal to said control signal generating means.

4,310,792
SEMICONDUCTOR VOLTAGE REGULATOR

Shiroh Iwatani, and Mitsuharu Morishita, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1979, Ser. No. 48,463
Claims priority, application Japan, Jun. 30, 1978, 53-80338; Jul. 7, 1978, 53-83299
Int. Cl.³ H02J 7/16; H02P 9/30; H01L 27/00
U.S. Cl. 322—28 3 Claims

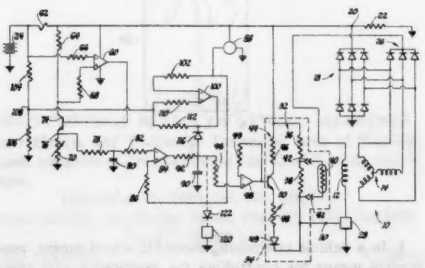


1. A semiconductor voltage regulator device comprising: a power transistor connected between one end of a field coil disposed on an AC generator and ground, said field coil having the other end thereof connected to a D.C. potential and being excited with a full-wave rectified output voltage from said AC generator; a control circuit for controlling the ON-OFF operation of said power transistor to thereby control an output voltage from said AC generator to a predetermined magnitude; a two layer semiconductor diode for absorbing induction energy generated by said field coil; and a common semiconductor substrate having said power transistor, said control circuit and said semiconductor diode disposed thereon, wherein said substrate forms the collector region of said power transistor and one of said two semiconductor diode layers.

4,310,793
CHARGE/FLOAT MOTOR VEHICLE ELECTRICAL SYSTEM

Leonard J. Sheldrake, Noblesville; Stanley E. Olson, Spencer, and Philip A. Karau, Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed May 27, 1980, Ser. No. 153,278
Int. Cl.³ H02J 7/14
U.S. Cl. 322—28 2 Claims



1. A motor vehicle electrical system that is operative to provide alternate charge and float modes of operation for charging the storage battery comprising:

engine-driven electric generator means having an energizable field winding for controlling the output voltage of said generator means;

a storage battery;

conductor means connecting said storage battery across the output terminals of said generator means whereby said storage battery is charged by said generator;

at least one electrical load connectable across said conductor means;

voltage regulating means connected to said field winding for controlling the energization of the field winding, said voltage regulating means comprising a voltage sensing circuit being responsive to the voltage across said conductor means and having first and second alternately engageable states, said first state corresponding to a battery charge mode of operation wherein said voltage sensing circuit controls the voltage regulator in a manner to maintain a substantially constant regulated output voltage from said generator which is higher than the terminal voltage of said battery, and said second state corresponding to a float mode of operation wherein said voltage sensing circuit controls the voltage regulator in a manner to reduce the regulated output voltage of said generator to a lower value, said voltage sensing circuit including means effective during said charge mode of operation for varying said regulated voltage as a function of battery electrolyte temperature;

current sensing means for sensing battery charging current;

control means responsive to said current sensing means, said control means being effective during said battery charge mode of operation to engage said second state of said voltage sensing circuit when the charging current supplied to the battery drops below a first reference level

corresponding to a high state of charge of said battery; and

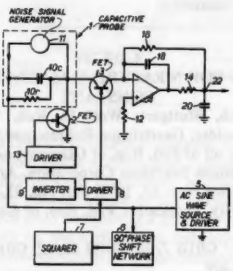
timer means for periodically engaging said first state of said voltage sensing circuit, whereby said charge mode of operation is periodically engaged to sample the state of charge of said battery.

4,310,794

CAPACITIVE PROBE DETECTION SYSTEMS

Lawrence C. Maier, Middlebury, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Continuation of Ser. No. 854,574, Nov. 25, 1977, abandoned.
This application Aug. 9, 1978, Ser. No. 932,391
Int. Cl.[3] G01R 27/26
U.S. Cl. 324—61 R 3 Claims



1. In a capacitive probe detection system for providing an output signal indicative of an environmental condition, including a probe which includes a capacitive component and a resistive component having component values which vary with variations in the environment in which the probe is located, an alternating voltage source, circuit means for continuously connecting the alternating voltage source to energize the probe, and current sensing means for sensing at least a portion of the current flowing through the probe, the improvement wherein the circuit means comprises:

a first current path which extends between the probe and the alternating voltage source and includes a first electrically actuated switching means for opening or closing the first current path;

a second current path, which extends in parallel with the first current path between the probe and the alternating voltage source, and which includes a second electrically actuating switching means for opening and closing the second current path; and

control means for simultaneously opening the first switching means and closing the second switching means during alternate 180° peak-to-peak portions of the alternating voltage signal, which includes

a phase shift circuit connected to the alternating voltage source to provide a voltage signal 90° out of phase with the alternating voltage signal,

a squaring circuit connected to receive the voltage signal from the phase shift circuit to produce a first square wave,

first switch actuating means for opening and closing the first switching means in response to the first square wave, and

second switch actuating means for opening and closing the second switching means in response to the first square wave; and the current sensing means comprises:

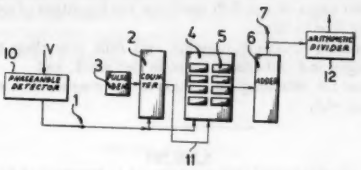
signal integrating means, which is disposed in the first current path, for providing an output voltage signal which is proportional to an integrated value of the current flowing in the first current path, and which constitutes the system output signal.

4,310,795

CIRCUIT MEASURING AVERAGE PERIOD OF PERIODIC SIGNAL

Johan K. Fremerey, Bonn, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich, Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Apr. 3, 1980, Ser. No. 136,926
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1979, 2914072
Int. Cl.[3] G01R 23/02
U.S. Cl. 324—78 D 10 Claims



1. A device for determining the average period of a low-frequency period signal, comprising:

a phase-angle monitor receiving said periodic signal for emitting an enabling pulse upon detecting a predetermined phase angle of said periodic signal;

a pulse generator for producing a train of high-frequency stepping pulses;

a counter connected at a resetting input to said monitor and at an incrementing input to said generator for counting the number of said stepping pulses between consecutive enabling pulses;

a data register connected to said monitor and to said counter for loading the contents thereof in response to each enabling pulse from said monitor, said register having a plurality of storage cells for memorizing respective counts attained by said counter during a plurality of consecutive cycles of said periodic signal; and

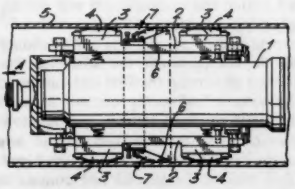
summing means connected to said register for algebraically combining the cell contents thereof to obtain, upon the emission of each enabling pulse, a respective total stepping-pulse number proportional to the average period of said periodic signal.

4,310,796

MAGNET ASSEMBLIES WITH PLURAL METALLIC FOIL CONTACT MEMBERS FOR PIPELINE INSPECTION VEHICLES

John C. Braithwaite, Ponteland, and David J. McGee, Barns Park, both of England, assignors to British Gas Corporation, London, England

Filed Oct. 1, 1979, Ser. No. 80,522
Claims priority, application United Kingdom, Oct. 2, 1978, 38915/78
Int. Cl.[3] G01R 33/12; G01N 27/82
U.S. Cl. 324—220 15 Claims



1. A magnetic coupling member which is capable of attachment to a magnet so as to form a magnet assembly for use on

a pipeline inspection vehicle, said magnetic coupling member including

a plurality of thin, generally rectangular low magnetic reluctance metallic foils which are aligned with one another for conducting magnetic flux, each foil having a side edge along its elongated dimension labeled a bottom edge and an opposite side edge for contacting the internal surface of said pipeline and labeled a top edge,

a plurality of generally rectangular spacer strips, a separate spacer strip being positioned between each pair of foils to thereby form a stack, said spacer strips having narrower widths, than said foils and being positioned near the bottom edges of said foils such that the top edges of said foils are free to bend,

means for clamping together said foils near their bottom edges and said spacer strips in said stack, and

means for attaching said stack to the magnet of a magnet assembly.

4,310,797

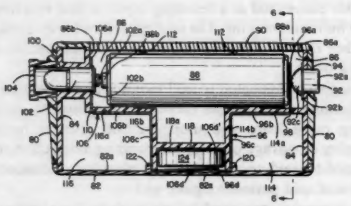
STUD DETECTOR USING A MAGNETICALLY ACTUATED SWITCH WITH MAGNETIC BIASING

Richard A. Butler, 6334 St. John's Dr., Eden Prairie, Minn. 55344

Continuation-in-part of Ser. No. 944,244, Sep. 21, 1978, abandoned. This application Jun. 21, 1979, Ser. No. 50,878

Int. Cl.³ G01N *27/72;* G01R *33/12;* H01H *9/00*

U.S. Cl. 324—228 **16 Claims**



1. An apparatus for indicating the presence of ferrous fasteners beneath a wall covering, the apparatus comprising:

magnetic actuated switch means having a substantially planar wall engaging surface, first and second terminals, and which normally is in a state in which current cannot pass between the first and second terminals and which switches to a state which allows current to pass between the first and second terminals when the wall engaging surface is held near a ferrous substance, the magnetic actuated switch means comprising:

a compartment having side walls and first and second ends, the first end being located proximate the wall engaging surface;

a first contact connected to the first terminal, the first contact being positioned within the compartment;

a second leaf spring contact connected to the second terminal, the second leaf spring contact being positioned within the compartment and having a free end for contacting the first contact;

a permanent magnet arranged to permit sliding movement within the compartment, the permanent magnet, when positioned proximate the first end causing the free end of the second leaf spring contact to make electrical contact with the first contact, thereby allowing current to pass between the first and second terminals, and when positioned proximate the second end permitting the free end of the second leaf contact to assume a position spaced from the first contact thereby preventing current from passing between the first and second terminals, wherein the first contact and the second leaf spring contact are positioned between the first end and the permanent magnet; and

ferrous metal bias means on an opposite side of the second end of the compartment from the permanent magnet, wherein magnetic attraction between the magnet and the ferrous metal bias means normally biases the permanent magnet to a position proximate the second end, and wherein magnetic attraction between the permanent magnet and a ferrous substance proximate the wall engaging surface causes the permanent magnet to slide to a position proximate the first end;

light source means; and

power source means conductively connected in series with the magnetic actuated switch means and the light source means whereby the light source means is energized when the substantially planar wall engaging surface is held near a ferrous substance.

4,310,798

APPARATUS FOR MEASURING MAGNETOSTRICTION CONSTANT

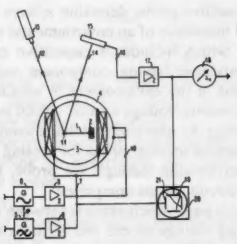
Arwed Brunsch, Stuttgart; Wolf D. Ruh, Sommerhofenstr; Jochen Schneider, Gaertringen-Rohrau, and Gerhard Trippel, Sindelfingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1979, Ser. No. 93,344

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851771

Int. Cl.³ G01B *7/24;* G01R *33/12;* G01N *27/72*

U.S. Cl. 324—209 **3 Claims**



1. Apparatus for determining the magnetostriction constant of soft magnetic and isotropic magnetic thin film materials comprising

a substrate on which said material is applied,

said substrate being clamped at one end and capable of being deflected under the influence of a magnetic field;

means for exposing said material to an AC magnetic field to produce magnetostrictive resonance in said material;

optical means for measuring the deflection of said material resulting from application of said magnetic field to provide a measure of the magnetostriction constant of said material;

two pairs of coils for generating said AC magnetic field,

a first frequency adjustable oscillator whose output is applied to one of said pairs of coils,

a second oscillator having an input connected to the output of said first oscillator, and having its output connected to the other pair of coils, said second oscillator emitting the same frequency as said first oscillator but with adjustable phase;

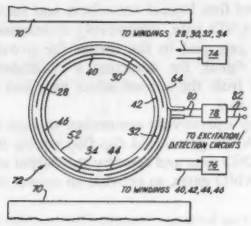
said optical means including a radiation source providing a light beam directed onto the free end of said sample, and

a position-sensitive photodiode onto which impinges said beam reflected from said sample, the output signal of said photodiode being applied to a device indicating the magnetostriction constant.

4,310,799
COIL WINDING FOR QUADRUPOLAR FIELDS

James M. S. Hutchison; Robert J. Sutherland; William A. Edelstein, and John R. Mallard, all of Aberdeen, Scotland, assignors to National Research Development Corporation, London, England

Filed Oct. 15, 1979, Ser. No. 84,562
Claims priority, application United Kingdom, Oct. 17, 1978, 40779/78
Int. Cl.³ G01N 27/00
U.S. Cl. 324—319 7 Claims

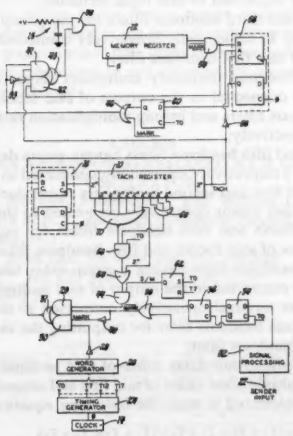


1. An air-cored coil for producing magnetic fields of quadrupolar configuration within a cylindrical volume comprising a pair of similar independent quadrupole windings uniformly interpolated on the circumference of the cylindrical surface, the winding of each pole comprising a plurality of conductors lying longitudinally on the surface and distributed symmetrically over a respective quadrant of the circumference such that the winding density is greatest at the centre of the quadrant, the outer conductors of adjacent pole windings being interlaid to produce over the cylindrical surface a substantially uniform array of conductors in a single layer such as to be effective as an electrostatic screen between the cylindrical volume and the space adjacent the external surface of the conductors.

4,310,800
DIGITAL FREQUENCY MEASURING CIRCUITRY

Benjamin H. Baker, Davison, and David W. Taylor, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1979, Ser. No. 92,434
Int. Cl.³ G01R 23/02
U.S. Cl. 324—78 D 7 Claims

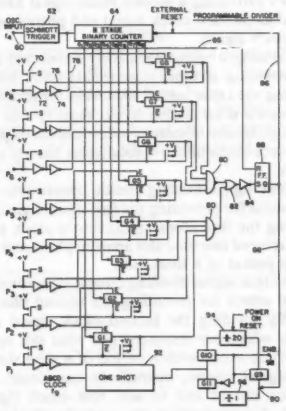


1. Digital frequency measuring circuitry for developing a binary word proportional to the frequency of an input signal comprising, a first shift register means, a second shift register means, timing means establishing a word time interval substantially less than the interval of said input signal, means responsive to said timing means for updating the content of said second register means with the content of said first register means each cycle of said input signal, means for increasing the content of said first register means by a predetermined amount during one word time interval each cycle of said input signal, means for decreasing the content of said first register means during subsequent word time intervals of said input signal by an amount proportional to the content of said first register means, means for comparing the content of said first register means and second register means each word time interval and for updating the content of said second register means with the content of said first register means if the content of said second register means is greater than the content of said first register means.

4,310,801
PROGRAMMABLE DIVIDER

John D. Baker, Lisle, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Division of Ser. No. 781,205, Mar. 25, 1977, Pat. No. 4,167,699.
This application May 16, 1979, Ser. No. 39,376
Int. Cl.³ H03K 21/36
U.S. Cl. 328—48 7 Claims



1. A divider for dividing the frequency of an input signal by a selectable integer to produce an output signal comprising:

(a) a multiple stage ripple counter incremented by said input signal and having an output for each stage thereof,

(b) means selectively enabled to gate the output of each stage of said counter to a producing means, said gating means comprising a separate transmission gate coupled between the output of each stage and the producing means for transmitting, when enabled, the output of each stage to the producing means independent of the state of the output of any stage,

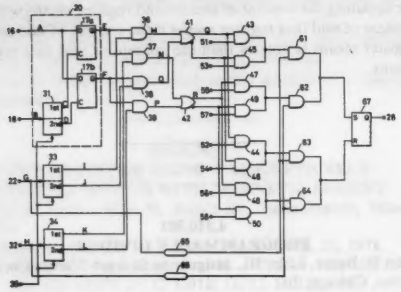
(c) means for enabling selected ones of said transmission gates, the value of said integer being determined by selecting which of said transmission gates are enabled,

(d) means for producing said output signal only when an output is received from all counter stages whose corresponding gating means have been enabled.

4,310,802
LOGICAL WAVEFORM GENERATOR

Yoshichika Ichimiya, Tokorozawa; Tsuneta Sudo, Kodaira; Hiromi Maruyama, Gyoda; Shigeru Sugamori, Gyoda; Susumu Sumida, Gyoda, and Takashi Tokuno, Gyoda, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp. and Takeda Riken Kogyo Kabushiki Kaisha, both of, Japan

Filed Aug. 24, 1979, Ser. No. 69,348
Claims priority, application Japan, Aug. 28, 1978, 53-105302
Int. Cl.³ H03K 5/22
U.S. Cl. 328—110 **7 Claims**

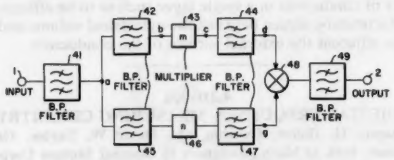


1. A logical waveform generator comprising:
means for providing an input logical data train;
means for providing a first clock signal;
means for providing a second clock signal having the same period as the first clock signal and phased apart from the first clock signal;
a data dividing circuit, operatively connected to said means for providing an input logical data train, for sequentially dividing the input logical data train for each time slot into n (where n is an integer larger than 1) data trains which are sequentially displaced one time slot apart in phase, each data block of the n data trains having an n time slot length;
a first clock signal dividing circuit, operatively connected to said means for providing the first clock signal, for spatially dividing the first clock signal into n clock signals which are displaced one time slot apart in phase and which occur with a period of n time slots;
a second clock signal dividing circuit, operatively connected to said means for providing the second clock signal, for spatially dividing the second clock signal into n clock signals which are displaced one time slot apart in phase and which occur with a period of n time slots;
a first logical circuit, operatively connected to said data dividing circuit and to said first clock signal dividing circuit, for controlling the spatially divided first clock signals by the divided input logical data trains corresponding thereto and for providing, as an output, first controlled signals;
a second logical circuit, operatively connected to said data dividing circuit and to said second clock signal dividing circuit, for controlling the spatially divided second clock signals by the divided input logical data trains corresponding thereto and for providing, as an output, second controlled signals;
a first multiplexing circuit, operatively connected to said first logical circuit, for time multiplexing the first controlled signals to form a first logical waveform and an inverted first logical waveform;
a second multiplexing circuit, operatively connected to said second logical circuit, for time multiplexing the second controlled signals to form a second logical waveform and an inverted second logical waveform;
a first select gate, operatively connected to said second multiplexing circuit, for providing, as an output, the inverted second logical waveform;
a second select gate, operatively connected to said second multiplexing circuit, for providing, as an output, the second logical waveform;
a first AND gate, operatively connected to said first multiplexing circuit and to said means for providing the first clock signal, for detecting a coincidence between the first logical waveform and the first clock signal;
a second AND gate, operatively connected to said first multiplexing circuit and to the means for providing the first clock signal, for detecting a coincidence between the inverted first logical waveform and the first clock signal;
a third AND gate, operatively connected to said second select gate and to the means for providing the second clock signal, for detecting a coincidence between the output from the second select gate and the second clock signal; and
a flip-flop operatively connected to said first, second and third AND gates, said flip-flop set by the output of said first AND gate and reset by the output of said second and third AND gates, to provide an output logical waveform.

4,310,803
BANDPASS FILTER CIRCUIT

Hiroshi Kurihara, 2-15, Umesato 2-chome, Suginami-ku, Tokyo 166, and Sadao Takenaka, 3-15, Shinsugita-cho, Isogo-ku, Yokohama-shi, Kanagawa 235, both of Japan

Filed Aug. 20, 1979, Ser. No. 68,004
Claims priority, application Japan, Aug. 23, 1978, 53-102586
Int. Cl.³ H03H 11/02
U.S. Cl. 328—167 **12 Claims**



1. A bandpass filter circuit comprising:
an input terminal for receiving an input signal;
a first bandpass filter having a group delay time T_1 operatively connected to said input terminal;
second and third bandpass filters having group delay times T_2 and T_3 respectively operatively connected to the output of said first bandpass filter;
first and second frequency multipliers respectively operatively connected to the outputs of said second and third bandpass filters and having multiplication ratios of m and n respectively;
fourth and fifth bandpass filters having group delay times T_4 and T_5 respectively operatively connected to the outputs of said first and second multipliers respectively;
a multiplier means operatively connected to the outputs of said fourth and fifth bandpass filters for multipling the outputs of said fourth and fifth bandpass filters;
a sixth bandpass filter having a group delay time T_6 operatively connected to the output of said multiplier means;
an output terminal operatively connected to the output of said sixth bandpass filter for outputting the output of said sixth bandpass filter;
wherein the group delay times of said bandpass filters and the multiplication ratios of said first and second multipliers are preselected to meet the following equation:

$$m/n=(T_1+T_3+T_5+T_6)/(T_1+T_2+T_4+T_6),$$

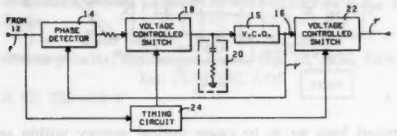
whereby the phase difference between a sinusoidal input signal present at said input terminal and the resultant sinusoidal outpt

signal present at said output terminal remains substantially constant for small deviations in the frequency of said input signal.

4,310,804
INPUT ACTIVATED FREQUENCY SYNTHESIZER

Donald C. Ryon, Carol Stream, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 875,251, Feb. 6, 1978, abandoned. This application May 4, 1979, Ser. No. 36,130
Int. Cl.³ H03L *7/14, 7/16*
U.S. Cl. 331—1 A **2 Claims**



1. A phase locked loop with memory control and comprising in combination:

input means for receiving a signal;

phase detector means having a first input coupled to the input means;

voltage controlled oscillator means having an output signal which is frequency controllable by an output voltage signal from the phase detector means, the output signal of the oscillator means being coupled to a second input of the phase detector means;

switching means for coupling the output voltage signal of the phase detector means to the oscillator means in response to a received signal;

memory circuit means coupled to the input of the oscillator means and including charging means for being charged by the output voltage signal of the phase detector means, the memory circuit means controlling the output signal frequency of the oscillator means in the absence of a received signal at the input means;

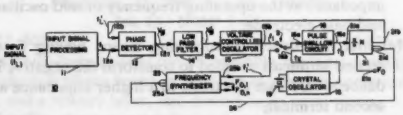
timing means responsive to the received signal for activating the switching means to decouple the output signal of the phase detector means from the oscillator means a predetermined period of time after each initial signal reception; and

second switching means for coupling the output signal of the oscillator means to an output means and wherein the timing means activates the second switching means for a second predetermined time interval, the second time interval being subsequent to and substantially longer than the first time interval.

4,310,805
PHASE-LOCKED LOOP STABILIZED BY A CRYSTAL OSCILLATOR

William P. Hackert, Schenectady, and William C. Hughes, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 13, 1979, Ser. No. 103,032
Int. Cl.³ H03L *7/10, 7/14, 7/18*
U.S. Cl. 331—1 A **14 Claims**



1. Apparatus for providing at least one output frequency signal phase-locked to the frequency of an input signal, comprising:

a phase detector having first and second inputs and an output having a signal related to the difference in phase between the signals at the first and second inputs;

input signal conditioning means receiving said input signal for providing a reference frequency signal to said first phase detector input; means connected to the phase detector output for filtering said phase detector output signal;

means receiving the filtered output signal from the filtering means for generating a periodic waveform having a first frequency controlled by the magnitude of the filtered phase detector output signal;

crystal controlled oscillator means for providing a signal at a second frequency;

frequency-subtractive means having a first input receiving a sum-frequency signal and a second input receiving the second frequency signal for providing an output signal having a third frequency equal to the difference between said sum-frequency and second signal frequency;

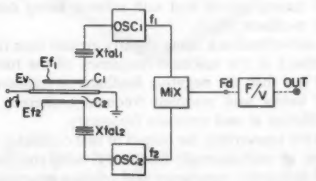
frequency-arithmetic means receiving the third frequency signal for synthesizing said at least one output signal and for providing a loop signal for coupling to the second input of said phase detector for causing said waveform generating means frequency to vary and lock the frequency of said at least one output frequency to said input signal frequency; said frequency-arithmetic means also providing a signal at a fourth frequency; and

means receiving the waveform generating means output signal and said fourth frequency signal for adding the first and fourth frequency signals to provide the sum-frequency input signal to the first input of the frequency-subtractive means.

4,310,806
DEVICE FOR DETECTING LINEAR DISPLACEMENT

Hiroomi Ogasawara, 3821-4, Yamakita, Yamakitamachi, Ashigarakami-Gun, Kanagawa-Ken, Japan

Filed Oct. 18, 1979, Ser. No. 86,370
Claims priority, application Japan, Oct. 20, 1978, 53-129314
Int. Cl.³ G01R *27/26;* H03B *21/01*
U.S. Cl. 331—40 **8 Claims**



1. A device for detecting linear displacement of an object comprising:

(a) a sensor including a first electrode; a pair of second electrodes spaced apart in parallel relation and having said first electrode therebetween, parallel therewith and spaced from a first one of said pair by a first distance and from the other one of said pair by a second distance to form therewith a pair of capacitors; and means responsive to linear displacement of the object for moving one of (i) said first electrode and (ii) said pair of second electrodes with respect to the other thereof by a distance A and in a direction forming an angle θ with respect to said parallel electrodes, to vary the first distance and the second distance differentially by an amount equal to Asin θ so that as the object is linearly displaced the capacitance of one of said capacitors increases while the capacitance of the other of said capacitors correspondingly decreases differentially;

(b) two oscillator circuits, each having an associated one of

said capacitors incorporated therein as a frequency varying component; and

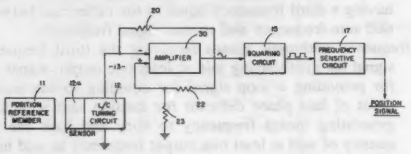
(c) mixer means connected to said two oscillator circuits for providing a frequency difference signal determined by the difference in the frequencies of said two oscillator circuits and indicative of the extent of linear movement of the object.

4,310,807

DIGITAL POSITION SENSOR INCLUDING L/C SENSING OSCILLATOR

Donald E. McKee, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 19, 1979, Ser. No. 105,435
Int. Cl.³ G01V *3/11*; H03K *3/023*
U.S. Cl. 331—65 **4 Claims**



1. A position sensor for providing a digital signal output in accordance with the relative position between a sensing element and a predetermined object comprising

an oscillator having an L/C tuning circuit, said sensing element comprising at least a portion of the tuning circuit, the reactance of said sensing element and the resonant frequency of the tuning circuit varying as a function of the relative position between the sensing element and the object,

a negative feedback loop from the output of the oscillator to the input thereof,

a positive feedback loop from the output of the oscillator to the input thereof,

one of said loops including said L/C tuning circuit and a resistor connected in series with said tuning circuit to form a voltage divider therewith, the connection between said tuning circuit and said resistor being connected to said oscillator input,

the positive feedback being slightly greater than the negative feedback at the resonant frequency of the tuning circuit and less than the negative feedback at frequencies above and below said resonant frequency, thereby sustaining oscillation at said resonant frequency,

means for converting the output of said oscillator to a square wave at said resonant frequency, whereby the value of said frequency represents said relative position, and

means responsive to said square wave for generating a position signal in accordance with said relative position.

4,310,808

HIGH POWER LASER EMPLOYING AN UNSTABLE RESONATOR

Robert L. Byer, Stanford, and Richard L. Herbst, Menlo Park, both of Calif., assignors to Quanta-Ray, Inc., Mountain View, Calif.

Continuation of Ser. No. 752,110, Dec. 20, 1976, abandoned. This application Sep. 20, 1979, Ser. No. 77,308
Int. Cl.³ H01S *3/081*
U.S. Cl. 331—94.5 C **13 Claims**

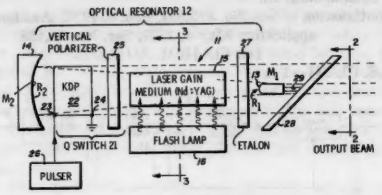
1. In a high power laser:

a positive branch unstable optical resonant cavity;

a lasing gain medium positioned with said cavity and having a longitudinal axis for amplifying the intensity of a beam of coherent optical radiation passing therethrough along said longitudinal axis;

means for pumping said lasing gain medium with sufficient energy to create a thermal gradient within said medium transverse to said axis which alters the medium's dielectric constant to form an optical lens having a characteristic focal length f; and

said resonant cavity including first and second reflective means separated by such a distance and having respective focal lengths of such dimension, in conjunction with said



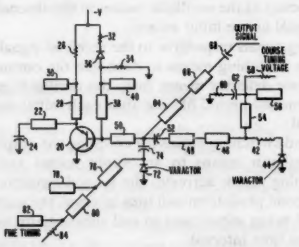
optical lens, so as to cause optical energy within said cavity to be reflected back and forth between said reflective means and through said lasing gain medium over an optical path which is free of any focal points along said path in the region between said reflective means and so as to produce a substantial flow of optical power within said resonant cavity in a direction transverse to said optical path and said longitudinal axis.

4,310,809

LOW NOISE MICROSTRIP VOLTAGE CONTROLLED OSCILLATOR

Daniel C. Buck, Hanover; Ricky D. Hess, Annapolis, and Edward C. Niehenke, Baltimore, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1979, Ser. No. 33,935
Int. Cl.³ H03B *5/18*
U.S. Cl. 331—117 D **8 Claims**



1. An oscillator circuit, comprising in combination:

(a) a transistor having base, emitter and collector electrodes;

(b) means for electrically coupling said collector electrode to the ground terminal of said oscillator circuit;

(c) a first circuit means having a high impedance at the operating frequency of said oscillator coupling said emitter to a source providing bias current to said emitter;

(d) a second circuit coupled between said emitter electrode and the ground terminal of said oscillator, the impedance of said second circuit means selected to reflect a negative impedance at the operating frequency of said oscillator at said base electrode;

(e) first impedance transforming means having first and second terminals coupled to transform the negative impedance at said base electrode to a higher impedance at said second terminal;

(f) series resonant circuit means, having a resonant frequency which is determined by a tuning voltage, coupled between the ground terminal of said oscillator and said

second terminal of said first impedance transforming means; and

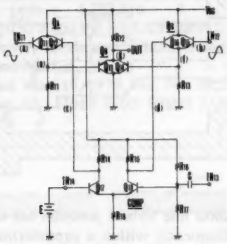
(g) first and second transmission line means coupled between said second terminal of said first impedance transforming means and an output terminal of said oscillator, the characteristic impedance of said first and second transmission line means being respectively high and low at the operating frequency of said oscillator.

4,310,810

MODULATOR SYSTEMS

Yasuhiro Toyomura; Hitoshi Fujisaki, and Hideo Onodera, all of Kodaira, Japan, assignors to Hitachi Denshi K.K., Tokyo, Japan

Filed Sep. 18, 1979, Ser. No. 76,241
Claims priority, application Japan, Sep. 22, 1978, 53-116017
Int. Cl.³ H03C *1/00*
U.S. Cl. 332—31 T **1 Claim**



1. A modulator system comprising:

emitter follower type first and second transistor pairs, emitter electrodes of the transistors of each pair being commonly connected, said first and second transistor pairs each having transistors of one conductivity type;

an emitter follower type third transistor pair, emitter electrodes of the transistors of the third pair being commonly connected, said third pair having transistors of one conductivity type, which conductivity type is opposite to that of the transistors in said first and second transistor pairs;

means for supplying clamped modulation signals to base electrodes of first transistors of said first and second transistors pairs, said modulation signals being of opposite polarity;

means for supplying signals to be modulated to base electrodes of second transistors of said first and second transistors pairs, said signals being of opposite polarity; and

means for connecting base electrodes of the first and second transistors of said third transistor pair to the commonly connected emitter electrodes of said first and second transistor pairs, thereby producing a modulated output signal from said commonly connected emitter electrodes of said third transistor pair.

4,310,811

REWORKABLE MULTI-LAYER PRINTED CIRCUIT BOARD

Thomas P. Currie, St. Paul, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 17, 1980, Ser. No. 130,679
Int. Cl.³ H01P *3/08*
U.S. Cl. 333—1 **4 Claims**

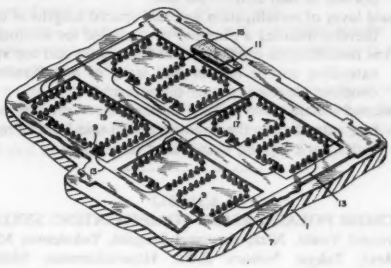
1. A multi-layer printed circuit assembly having a plurality of conductive planar layers, at least one of which is a reference layer, and a rework layer, said rework layer comprising:

a plurality of wires overlying said assembly;

means for insulating each of said wires from each other and said assembly;

means for semi-permanently affixing said wires and insulating means to said assembly; and

each of said wires having a characteristic impedance with respect to said reference layer selectively establishd to approximate the characteristic impedance of one of said



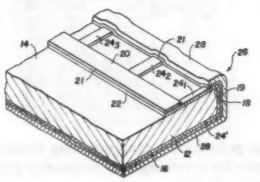
assembly's conductive planar layers with respect to said reference layer, whereby said wires can be selectively detached and used to make electrical jumper connections to said conductive planar layers of equivalent characteristic impedance.

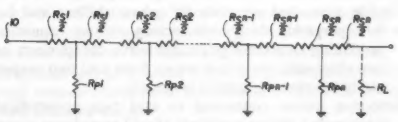
4,310,812

HIGH POWER ATTENUATOR AND TERMINATION HAVING A PLURALITY OF CASCADED TEE SECTIONS

Roger C. DeBloois, Westlake Village, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 18, 1980, Ser. No. 179,309
Int. Cl.³ H01P *1/22*
U.S. Cl. 333—81 A **11 Claims**





1. A microstrip power attenuator having a relatively flat frequency response adapted to be coupled to a load impedance, comprising, in combination:

a ceramic substrate having top, bottom and adjoining side surfaces;

a layer of cermet formed on said top, bottom and side surfaces, said layer on said top surface being configured to provide a predetermined length of cermet of selected width extending across said top surface in a substantially linear configuration and having a plurality of spaced lengths of cermet projecting outwardly from said linear configuration towards said side surface and terminating in said cermet layer extending therefrom around said side surface to and over a predetermined portion of said bottom surface;

a layer of metallization formed over said layer of cermet and being configured to at least overlay said linear configuration of cermet;

a metallized ground plane formed on said top surface to contact said spaced lengths of cermet and extending around said side surface to and over a predetermined portion of said bottom surface;

said layer of metallization and said spaced lengths of cermet thereby defining a plurality of cascaded tee sections;

first metallization contact means formed on said top surface extending to one end of said layer of metallization for coupling electrical power thereto; and

second metallization contact means formed on said top surface extending to the opposite end of said layer of metallization for coupling to said load impedance.

4,310,813

CROSS POLARIZATION COMPENSATING SYSTEM

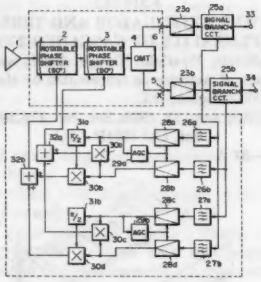
Hironori Yuuki, Niza; Kazunori Inagaki, Yokohama; Makoto Arai, Tokyo; Noboru Baba, Higashikurume; Matsuichi Yamada, Yokohama, and Hiroshi Kurihara, Atsugi, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1980, Ser. No. 154,096

Claims priority, application Japan, Jun. 5, 1979, 54/70377

Int. Cl.³ H04B *7/00*; H01P *1/161*

U.S. Cl. 333—117 **2 Claims**



1. A cross polarization compensating system comprising:

input means for receiving two elliptically polarized waves of opposite polarities;

two cascade-connected rotatable 90° phase shifters connected to said input means;

transducer means connected to the output of said two cascade-connected rotatable 90° phase shifters and having two perpendicularly intersecting output terminals for producing two cross-polarized wave components of the two elliptically polarized waves from said two perpendicularly intersecting output terminals;

detection means connected to said two perpendicularly intersecting output terminals of said transducer means for detecting two in-phase components of the same phase as their co-polarized components of said two cross-polarized wave components and two orthogonal components each having a phase difference of 90° from a corresponding one of the co-polarized waves of said two cross-polarized wave components;

addition means connected to said detection means for producing an addition output equal to the sum of said two inphase components;

subtraction means connected to said detection means for producing a difference output equal to the difference between said two orthogonal components; and

control means connected to said addition means, said subtraction means and said two cascade-connected rotatable 90° phase shifters to control one of said two phase shifters by said addition output and further to control the other of said two phase shifters by said difference output, so that said two elliptically polarized waves at the output terminals of said transducer means are made equal in the cross polarization, and so that a phase difference between said co-polarized wave components and a phase difference between said cross-polarized wave components are made equal in magnitude and opposite in sign.

4,310,814

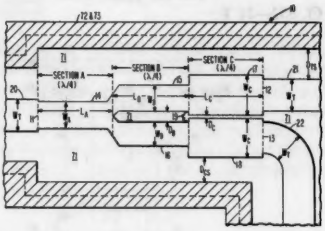
TRANSMISSION LINE HYBRID JUNCTION

David F. Bowman, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 11, 1980, Ser. No. 167,489

Int. Cl.³ H01P *5/19*

U.S. Cl. 333—121 **13 Claims**



1. A transmission line hybrid junction for transmitting RF signals having frequency within a predetermined bandwidth between a first port and a pair of ports comprising:

a first transmission line coupled to said first port and a pair of branch transmission lines coupled to said pair of ports;

said first transmission line including a first transforming section having electrical length of approximately one-quarter wavelength or odd multiple thereof of an operating frequency within said predetermined bandwidth, and joined to said pair of branch transmission lines each having a first section joined to a second section, wherein said first sections include transforming sections having electrical length of approximately one-quarter wavelength or odd multiple thereof of an operating frequency within said predetermined bandwidth, and said second sections include transforming sections having electrical length of approximately one-quarter wavelength or odd multiple thereof of an operating frequency within said predetermined bandwidth and said second sections of said pair of branch transmission lines closely coupled uniformly along their length to provide independent control of their values of characteristic impedance in the odd and even modes of excitation; and

a resistance element coupled between said pair of branch transmission lines at the approximate junction of said first and second sections.

4,310,815

ELECTROMAGNETIC DELAY LINE

Peter M. C. van der Linden, and Cornelis van Wieringen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 27, 1980, Ser. No. 163,768

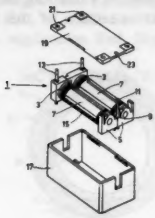
Claims priority, application Netherlands, Jul. 6, 1979, 7905281

Int. Cl.³ H03H *7/34*

U.S. Cl. 333—138 **4 Claims**

1. An electromagnetic delay line, comprising two cylindrical coil formers on the outer surfaces of which there are provided metal strips which extend parallel to their axes, said coil formers each supporting a winding which is insulated with respect to the metal strip and being adjacently arranged so that

their axes extend in parallel, characterized in that the two coil formers (5) are pivotably interconnected near one end by



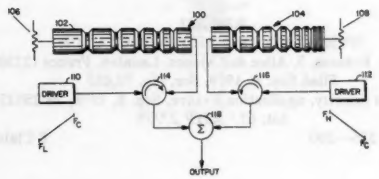
means of a narrow connecting strip (9) which is integral with the metal strips (7).

4,310,816

DISPERSIVE DELAY LINES

Harrison W. Fuller, Lexington, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed May 14, 1979, Ser. No. 39,230
Int. Cl.[3] H01P 9/00; H03H 7/30
U.S. Cl. 333—156 7 Claims



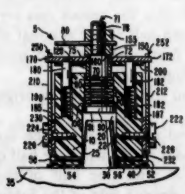
1. A method of reducing the transmission loss in a reflective delay line comprising the steps of:
dividing the line so as to provide a number of single port segments;
simultaneously feeding appropriate upswept and downswept signals to the ports formed by the division of the line;
removing reflected signals from the ports; and,
summing the removed signals.

4,310,817

AUTOMATIC CIRCUIT BREAKING ACCESSORY FOR AN ELECTRIC STORAGE BATTERY

Fred A. McNiel, 611 Bouldin Ave., Austin, Tex. 78704

Filed May 5, 1980, Ser. No. 146,717
Int. Cl.[3] H01H 71/46
U.S. Cl. 335—13 20 Claims



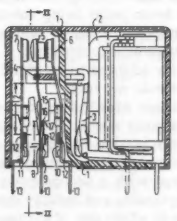
1. An automatic circuit breaker for an electric storage battery having a terminal post, comprising:
a housing;
a bore passing through said housing, said bore having first and second portions in said housing, said first portion of said bore adapted to receive the terminal post;
a piston having first and second ends, said first end of said piston being adapted to receive a battery cable;
mounting means for said piston adapted to slidably position said second end of said piston in said first portion of said bore;
bias means adapted to slide said second end of said piston toward said second portion of said bore;
latch means adapted to engage said mounting means to position said second end of said piston in contact with the battery post; and
trip means adapted to disengage said latch means from said mounting means, thereby allowing said bias means to slide said second end of said piston toward said second portion of said bore and out of contact with the battery post.

4,310,818

ELECTROMAGNETIC RELAY WITH IMPROVED FIXED CONTACT ELEMENTS

Richard Essler, Munich, and Helmut Schedele, Hoegling, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 28, 1980, Ser. No. 115,901
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1979, 7909179[U]
Int. Cl.[3] H01H 50/14
U.S. Cl. 335—135 6 Claims

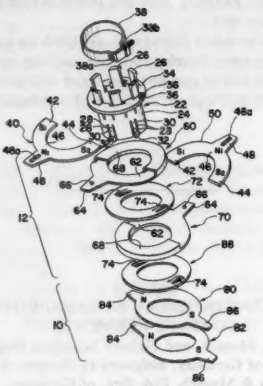


1. A relay comprising:
a base having a plurality of parallel slots therein;
a plurality of leaf-spring contact elements each extending through one of said base slots and at least one of said contact elements having a longitudinal slot therein;
an electromagnetic actuator means for moving at least one of said contact elements in response to a signal received by said actuator means;
a longitudinally extending tab carried on at least one of said contact elements, said relay base having at least one receptacle in registry with said tab when said contact element carrying said tab is anchored in said base, said receptacle having a grommet therein for twistingly receiving said tab for retaining said tab therein;
at least one of said contact elements having a lengthwise slot therein perpendicular to said longitudinal slot dividing said contact element into parallel legs, one of said legs carrying said longitudinally extending tab thereon and being anchored to said base, and the other of said legs being movable; and
at least one longitudinal rib carried on said base, said rib being received in the longitudinal slot in one of said contact element for anchoring said one contact element in said base.

4,310,819
MAGNETIC BEAM ADJUSTING ARRANGEMENT

Toru Morita, Katano; Yasumasa Takahasi, Hirakata; Kohei Akamathu, Ikoma, and Takasi Inothume, Gifu, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed May 13, 1980, Ser. No. 149,491
Claims priority, application Japan, May 17, 1979, 54-61154
Int. Cl.³ H01F 1/00
U.S. Cl. 335—212 9 Claims



1. A magnetic beam adjusting arrangement for use in adjusting static convergence in an in-line, tri-beam, cathode ray tube having a cylindrical neck enclosing a trio of in-line beam paths, a central one of said in-line beam paths substantially coinciding with the longitudinal axis of said neck with the remaining outer ones of said in-line beam paths being substantially symmetrically disposed on opposite sides of said axis, said magnetic beam adjusting arrangement comprising:

a cylindrical holder adapted to be rigidly mounted on the neck of said cathode ray tube;

a first magnet element of a U-shaped configuration having two arms and a joint portion from which the two arms extend, said joint portion being magnetized with a first pole and an intermediate portion of the respective arms being magnetized with a second pole, said first magnet element being rotatably and radially movably mounted on the holder so as to adjust one of the two outer beam paths by the magnetic field produced by the first magnet element; and

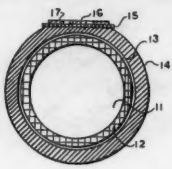
a second magnet element of a U-shaped configuration having two arms and a joint portion from which the two arms extend, said joint portion being magnetized with the first pole and an intermediate portion of the respective arms being magnetized with the second pole, said second magnet element being rotatably and radially movably mounted on the holder so as to adjust other of the two outer beam paths by the magnetic field produced by the second magnet element.

4,310,820
MAGNETIZING DEVICE

Hans Lanik, Traiskirchen, Austria, assignor to EVVA-Werk Spezialerzeugung von Zylinder- und Sicherheitsschlössern Gesellschaft m.b.H. & Co. Kommanditgesellschaft, Vienna, Austria

Division of Ser. No. 894,849, Apr. 10, 1978, Pat. No. 4,238,752.
This application May 22, 1980, Ser. No. 152,367
Claims priority, application Austria, Apr. 13, 1977, 2549/77; Jul. 27, 1977, 5494/77; Jul. 27, 1977, 5497/77
Int. Cl.³ H01F 13/00, 27/28
U.S. Cl. 335—284 3 Claims

1. A magnetizing system, comprising a cylindrical transformer core; a first winding surrounding said core; a second winding surrounding said first winding, said second winding being formed as a metal tube and provided with a slot on the upper surface thereof and having at least one portion located within said slot, said portion extending beyond said upper surface and having a cross-section of the size substantially



lower than the size of said slot producing a magnetic field of high density magnetizing a magnet material; and an element covering the material magnetized, said element being formed of a material having good electrical conductivity for absorbing the stray fields whereby the material magnetized is exposed to the magnetic field produced by said portion.

4,310,821
SPIRALLED PRINTED INDUCTANCE

Andre L. Frances, 3, Allee des Ajoncs, Lannion, France (22300)

Filed Sep. 4, 1979, Ser. No. 72,483
Claims priority, application France, Sep. 8, 1978, 78 25927
Int. Cl.³ A01F 27/78
U.S. Cl. 336—200 8 Claims

1. A printed inductance comprising:

a flat flexible insulating supporting plate;

a first printed conductive spiral supported on one face of said plate;

a second printed conductive spiral on another face of the plate which is parallel to the one face;

said first and second spirals conductive having a midline folding axis which divides the spirals and serves as a folded edge to provide a width half of the original width;

said flat plate said first spiral and said second spiral being folded back through 180°;

said first and second spirals having an origin which lies on said folding axis;

said first and second spirals having the same direction of rotation around said origin with one half of the first spiral being symmetrical with one half of the second spiral which is on the opposite side of the folding axis; another half of the first spiral being symmetrical with respect to anther half of the second spiral which is on the opposite side of the folding axis; and

said flexible plate and spirals being provided with a metalized hole electrically connecting said spirals together at the origin of said spirals;

4,310,822

TEMPERATURE CONTROL DEVICE FOR AQUARIUM HEATER

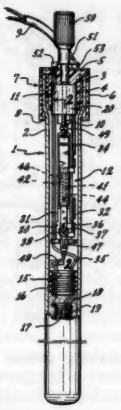
Wolfgang Jager, Wustenrot-Finsterrot, Fed. Rep. of Germany, assignor to Ebo-Jager, Inc., El Segundo, Calif.

Filed Feb. 19, 1980, Ser. No. 122,436

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1979, 2927292

Int. Cl.³ H01H 71/16

U.S. Cl. 337—53 10 Claims



1. A temperature control device for use with an aquarium heater, including

a control housing,

a first contact fastened to the control housing,

a second contact responsive to the temperature responsive movement of a bimetallic strip maintained at the control housing and movable between a closed position wherein the second contact abuts the first contact, and an open position wherein the second contact is separated from the first contact,

a plate spring,

a second contact fastened at the free end of the plate spring and with the plate spring mounted on the control housing and movable through an unstable intermediate position between a first stable position wherein the contacts lie abuting one another and a second stable position wherein the contacts are separated from one another,

the plate spring abuting a stop on the control housing and with the bimetallic strip abuting the plate spring and moving the plate spring in response to temperature changes between the first and second positions, and

wherein the plate spring in its movement between abuting the stop and abuting the contact is prestressed by abutment with the bimetallic strip and with the abutment of the plate spring with the bimetallic strip in the area between the fixed mounting of the plate spring on the control housing and the free end of the plate spring, and wherein the plate spring carries at its free end a resilient tongue and with a free end of the tongue abuting a stop fixed to the housing so that the tongue curves outwardly from the plane of the plate spring and provides a prestress of the plate spring.

4,310,823

STRAIN GAUGE STRIP ELEMENT AND METHOD OF ITS MANUFACTURE

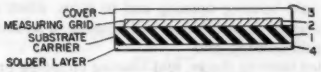
Norbert Rücker, Karlstein; Michael Sellschopp, Bruchköbel, and Hans-Ullrich Fuchs, Hanau, all of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Jan. 14, 1980, Ser. No. 111,707

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1979, 2902242

Int. Cl.³ G01L 1/22

U.S. Cl. 338—2 8 Claims



1. Strain gauge element comprising

a strip, or foil like carrier element (1) of temperature resistant plastics;

a strain gauge grid (2, 3) applied to said carrier (1) on one side thereof, the other side of the element being adapted to be secured to a metal structure, the strain of which is to be measured by the gauge,

and comprising, in accordance with the invention,

a layer (4) capable of being soldered to said metal structure which includes three sublayers,

the sublayer immediately adjacent said strip or foil like element (1) comprising a first sublayer of from 1 to 8 μm thickness of a material selected from the group consisting of a chromium-nickel alloy and an iron-chromium-nickel alloy;

the second sub layer being of at least 5 μm thickness of nickel;

and the third sub-layer next to said second sub-layer being of between 4 to 10 μm thickness and of gold.

4,310,824

ROTARY VARIABLE RESISTOR

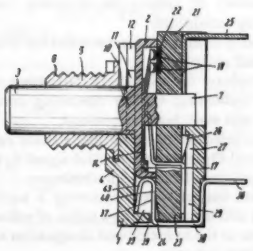
Wolf-Erhard Steigerwald, Bad Neustadt, Fed. Rep. of Germany, assignor to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt, Fed. Rep. of Germany

Filed May 14, 1979, Ser. No. 38,826

Claims priority, application Fed. Rep. of Germany, May 27, 1978, 2823285

Int. Cl.³ H01C 10/34

U.S. Cl. 338—174 20 Claims



1. A rotary variable resistor of modular construction, comprising:

a generally u-shaped housing defining a mouth;

a resistance element within said housing, having a carrier, a resistance guide way disposed on said carrier, and terminal contact surfaces;

terminal members in electrical contact with said terminal contact surfaces;

a rotor supported for rotation within said housing;

a collector element;

a contact element coupled for rotation with said rotor and in sliding contact with said collector element and said resistance element,

said housing permitting said rotor, said collector element, and said resistance element to be inserted into said mouth in a direction generally perpendicular to the axis of rotation of said rotor, said housing and said resistance element having means for retaining said resistance element in position in said housing; said rotor, said collector element, and said resistance element dimensioned to substantially close said housing opening and to form, when received and retained in position in said housing, a structural unit with said housing, and

a threaded bushing flange, said housing including projection means for receiving and retaining said bushing flange on said housing.

4,310,825

VOICE WARNING SYSTEM FOR AN AUTOMOTIVE VEHICLE

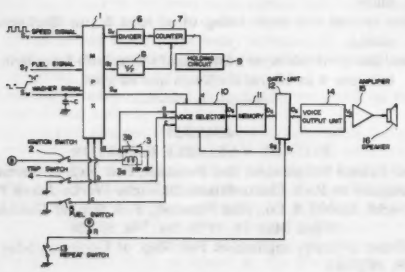
Masakazu Tsunoda, Fujisawa, and Teruo Kawasaki, Yokohama, both of Japan, assignors to Nissan Motor Company Limited, Kanagawa, Japan

Filed Oct. 23, 1980, Ser. No. 199,708

Claims priority, application Japan, Oct. 24, 1979, 54-146310[U]

Int. Cl.³ G08B *19/00*

U.S. Cl. 340—52 F **2 Claims**



1. A voice warning system for an automotive vehicle, which comprises:

(a) a voice warning apparatus comprising:

(1) a plurality of sensors for detecting various vehicle operating conditions;

(2) a plurality of information switches for obtaining signals from said sensors;

(3) a multiplexer for selectively outputting one of various signals indicating vehicle operating conditions when one of said switches is depressed;

(4) a voice selector for outputting a voice output designation signal D_s and a gate control signal S_g in accordance with the signal from said multiplexer;

(5) a voice output unit for storing a number of voice outputs and for outputting a series of voice signals V_s in response to the voice output designation signal D_s from said output selector.

(b) a memory for storing temporarily the voice output designation signals D_s, being disposed after said voice selector 10,

(c) a repeat switch for outputting a repeat signal S_r to said voice selector; and

(d) a gate circuit for outputting the designation signal D_s stored in said memory to said voice output unit in response to the signal S_g from said voice selector or the signal S_r from said repeat switch,

whereby voice warning information is indicated to the driver repeatedly, whenever said repeat switch is depressed.

4,310,826

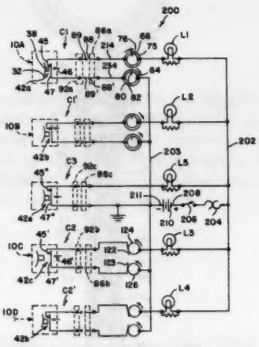
TIRE PRESSURE MONITORING SYSTEM

Louis D'Angiolillo, 11 Wyandotte La., East Islip, N.Y. 11730

Filed Jun. 9, 1980, Ser. No. 157,472

Int. Cl.³ B60C *23/02*

U.S. Cl. 340—58 **5 Claims**



1. Tire pressure monitoring system for a vehicle having wheels each of which carry a tubeless tire mounted on a rim thereof with a valve on each of said tubeless tires for filling said tire with compressed air, each of said wheels having a threaded hole near said rim, said pressure monitoring system comprising:

a housing having a threaded nipple at one end and an annual shoulder, said housing being threaded on one of said wheels through said threaded hole therein so that said annual flange abuts said wheel;

said housing having a passage communicating with the interior of said housing and enabling direct flow of air between the interior of said housing and the interior of said tubeless tire on said wheel;

a diaphragm means extending diametrically across said passage in said housing and a cylindrical core having one end abutting said diaphragm and movable in response to air pressure in said tire;

an electric switch mounted on said housing and abutting the other end of said core;

said switch having switch contacts opening and closing in response to movements of said core in said housing;

a spindle mountable in a fixed horizontal position on said vehicle for carrying said wheel in freely rotatable axially horizontal position;

a first insulated member carrying fixed electrically conductive, spaced contact rings, mounted in fixed position on said spindle;

first electric conductors connected to said rings and extending axially through said spindle;

second and third insulated members mountable on said wheel to rotate therewith;

electrically conductive wiper arms carried by said second and third insulated members respectively disposed to wipe said contact rings continuously when said wheel rotates; and

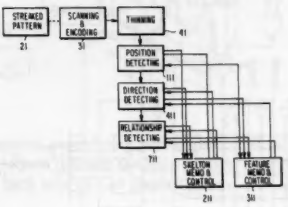
quickly disconnectable second electric conductors directly connecting said wiper arms to said switch contacts for conducting electric current through said first electric conductors when said switch contacts close.

4,310,827

DEVICE FOR EXTRACTING A DENSITY AS ONE OF PATTERN FEATURES FOR EACH FEATURE POINT OF A STREAKED PATTERN

Koh Asai, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1980, Ser. No. 136,610
Claims priority, application Japan, Apr. 2, 1979, 54-39648
Int. Cl.³ G06K 9/46
U.S. Cl. 340—146.3 E 5 Claims



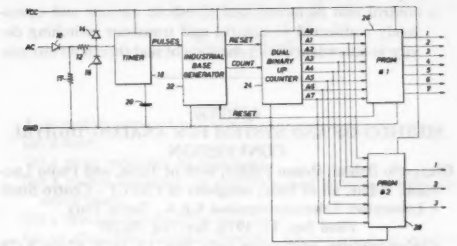
1. A device for extracting pattern features from a streaked pattern having a multiplicity of streaks at least on a fragmentary area thereof, a first plurality of streaks of said multiplicity of streaks having a second plurality of feature points having at least one predetermined relationship to said first plurality of streaks, said device comprising means for two-dimensionally scanning said streaked pattern in synchronism with a timing signal sequence to produce a sequence of picture element signals representative of said streaked pattern, means responsive to said picture element and said timing signal sequences for thinning said multiplicity of streaks generally to skeltons with a background area interposed between two adjacent skeltons to thereby convert said streaked pattern to a skelton pattern comprising skelton points representative of said skeltons and the background areas and to produce a sequence of skelton signals representative of the respective skelton points, feature point extracting and position detecting means responsive to said skelton and said timing signal sequences for extracting said feature points from said skelton points and for detecting positions of the extracted feature points in said skelton pattern, by the use of a skelton signal representative of each skelton point and with reference to the skelton signals representative of the skelton points in that first preselected area of said skelton pattern which is contiguous to and surrounds said each skelton point, to thereby produce a sequence of skelton signals representative of the detected positions, respectively, direction detecting means responsive to said position and said skelton signal sequences for detecting directions defined for the extracted feature points in relation to the skeltons into which said first plurality of streaks are thinned, by the use of a position signal representative of the position of each extracted feature point and with reference to the skelton signals representative of the skelton points in that second preselected area of said skelton pattern which is contiguous to and surrounds in said skelton pattern the skelton point extracted as said each extracted feature point, to thereby produce a sequence of direction signals representative of the detected direction, respectively, and relationship detecting means responsive to said position and said direction signal sequences for detecting a density for each extracted feature point selected as a reference feature point and a plurality of counts for said reference feature point, said density being determined by those of said extracted feature points which have positions in a predetermined area contiguous to and surrounding the position of said reference feature point and are selected as adjacent feature points, each count being related to the number of skeltons intervening between said reference feature point and a related feature point that is nearest to said reference feature point of the extracted feature points having positions in each of a prescribed number of divisions of said skelton pattern, whereby the detected positions, the detected directions, the densities detected for the respective reference feature points, and the counts detected as relationships for the respective reference feature points are extracted as said pattern features.

4,310,828

PROGRAMMED CONTROLLER

Garland W. Baker, Austin, Tex., assignor to Esquire, Inc., New York, N.Y.

Filed Dec. 31, 1979, Ser. No. 108,872
Int. Cl.³ H04Q 3/00
U.S. Cl. 340—825.22 12 Claims



1. An electronic controller, comprising

ac-to-digital pulse conversion means connectable to an ac source for producing pulses at regular intervals dependent upon the frequency of the source,

divider means for dividing the output from said conversion means to produce pulses at a long division of the pulse rate from said conversion means,

counter means connected to said divider means so that each count produces a sequentially coded output on multiple-line address outputs related to said count, and

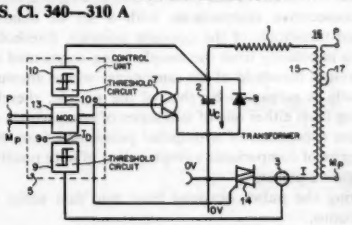
a PROM programmed for producing a plurality of control operations sequenced by the multiple-line address outputs from said counter means.

4,310,829

TRANSMITTING DEVICE FOR COMMUNICATIONS EQUIPMENT FOR GENERATING A SIGNAL TO BE SUPERIMPOSED ON AN AC POWER SUPPLY NETWORK

Fredy Rey, Dierikon, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Apr. 25, 1979, Ser. No. 33,303
Claims priority, application Switzerland, Apr. 27, 1978, 4569783/78
Int. Cl.³ H04B 3/54
U.S. Cl. 340—310 A 15 Claims



1. A transmitting device for generating narrow-band or wide-band audio frequency signals superimposed on an AC power supply network comprising:

a load circuit including a capacitor coupled to the conductors of the AC supply network;

a transistor switching device connected to said load circuit

to periodically couple a component of said load circuit to the conductors of the AC supply network;

a diode connected in parallel to the collector and emitter junction of said transistor switching device but with reversed polarity;

a current reference signal;

a current threshold circuit connected to compare said current reference signal and the value of current flowing through said load circuit;

a voltage reference signal;

a voltage threshold circuit connected to compare said voltage reference signal to the voltage appearing across said capacitor; and

a control unit including said threshold circuits and operatively connected to control said transistor switching device in accordance with the state of said threshold circuits.

4,310,830

METHOD OF AND SYSTEM FOR ANALOG/DIGITAL CONVERSION

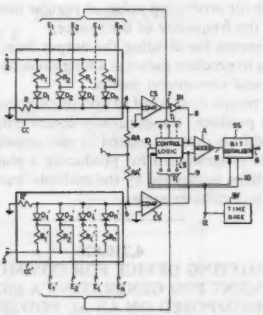
Giancarlo Babini; Bruno Fabbri, both of Turin, and Paolo Lucchini, Udine, all of Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Sep. 11, 1979, Ser. No. 74,295

Claims priority, application Italy, Sep. 13, 1978, 69106 A/78

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **6 Claims**



1. A method of converting samples of an amplitude-modulated analog signal into groups of binary pulses, comprising the steps of:

(a) simultaneously subjecting each signal sample to a first series of n consecutive comparisons with a set of binarily weighted thresholds of one polarity and to a second series of n consecutive comparisons with a set of binarily weighted thresholds of the opposite polarity, thresholds differing in polarity from the sample being augmented by any previous threshold of the same series whose absolute magnitude is surpassed by that of the sample, thereby obtaining from either one of said series of comparisons an unbroken succession of n unipolar pulses and from the other series of comparisons a combination of both positive and negative pulses;

(b) inverting the pulses obtained from said first series of comparisons;

(c) suppressing the pulses of a predetermined polarity obtained from said first series of comparisons after inversion in step (b) and from said second series of comparisons in step (a), thereby transforming said combination of positive and negative pulses into a group of n amplitude bits representative of the absolute magnitude of said sample; and

(d) generating a sign bit of logical value dependent upon the polarity of said unipolar pulses obtained in step (a).

4,310,831

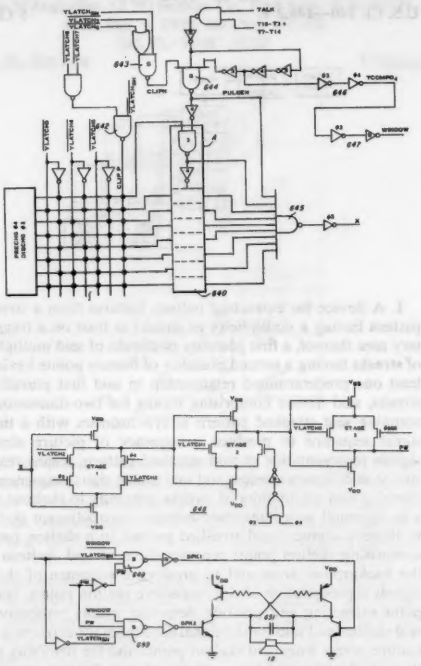
PULSE WIDTH MODULATED, PUSH/PULL DIGITAL TO ANALOG CONVERTER

Alva E. Henderson, and Gene A. Frantz, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 4, 1980, Ser. No. 118,156

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 M **5 Claims**



1. A digital-to-analog converter circuit comprising:

(a) full pulse width generating means responsive to a first plurality of digital values for selectively generating a variable pulse width which is a multiple of a basic period;

(b) fractional pulse width generating means responsive to a second plurality of digital values for selectively generating a variable pulse width which is a fraction of said basic period;

(c) pulse width coupling means for coupling the output of said full pulse width generating means and said fractional pulse width generating means; and

(d) converting means for converting the output of said pulse width coupling means into analog signals representative of said first and second pluralities of digital values.

4,310,832

BACK-LIT GRAPHIC DISPLAY PANEL APPARATUS

Charles A. Fitzgerald, Tucker, Ga., assignor to Fitzgerald Engineering Co., Inc., Tucker, Ga.

Filed Mar. 17, 1980, Ser. No. 130,842

Int. Cl.³ G09F *7/04*

U.S. Cl. 340—381 **11 Claims**

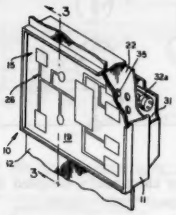
1. Graphic display apparatus, comprising:

a light-transmissive display panel having a front side and a back side;

a support panel disposed behind said display panel in spaced apart relation to said back side, and operative to support display interactive means between said display panel and

support panel in selected positions relative to said display panel;

means disposed behind said support panel to illuminate the support panel; and



said support panel being perforated to allow said illumination to pass through the lamp support panel and illuminate said back side of said display panel.

4,310,833

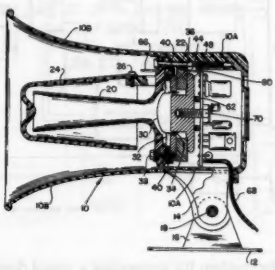
ELECTRICALLY-ENERGIZED HORN

Mitsuo Sakaguchi, Tokyo, Japan, assignor to Kobishi America, Inc., Carson, Calif.

Filed Jan. 15, 1980, Ser. No. 112,297

Int. Cl.³ G08B 3/00

U.S. Cl. 340—384 E **1 Claim**



1. An electrically-energized horn comprising: a casing including a tubular portion at one end and an outwardly flared portion extending towards its other end; an acoustic conduit mounted in said casing coaxially with said tubular portion and having a throat facing said one end of said casing; a horn mounted in said casing and enclosing said acoustic conduit; a movable bobbin mounted in said casing adjacent to said throat of said conduit; electromagnetic means coupled to said bobbin for causing said bobbin to move reciprocally with respect to said throat, said electromagnetic means comprising magnetic means mounted in said tubular portion of said casing in coaxial relationship with said bobbin and an electric coil wound around said bobbin; a diaphragm mounted in said tubular portion to said casing and mechanically coupled to said bobbin; a printed circuit board mounted in said tubular portion adjacent to said one end of said casing and extending thereacross; and a solid state electronic circuit mounted on said circuit board in said tubular portion of said casing and electrically connected to said electric coil, said solid state electronic circuit including circuitry for supplying driving electric power to said electromagnetic means, and said electronic circuit including a timer network for cutting off the driving electric power to said electromagnetic means a predetermined time after the electronic circuit has been energized.

4,310,834

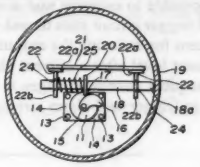
MOTOR ACTUATED BELL

Tadashi Ishii, Tokyo, Japan, assignor to Kobishi Electric Co., Ltd., Tokyo, Japan

Filed May 23, 1980, Ser. No. 152,757

Int. Cl.³ G08B 3/10

U.S. Cl. 340—392 **4 Claims**



1. A motor actuated bell which comprises:

(a) a base;

(b) a gong mounted on said base,

(c) a motor mounted on said base and having a rotatable drive shaft;

(d) a bracket mounted on said base,

(e) an elongated hammer member having one end slidably extending through said bracket for movement along the axis of said hammer member and having a second end for striking against said gong;

(f) an engaging means disposed on said elongated hammer member intermediate the opposite ends thereof,

(g) a contractible coil spring wound around said elongated hammer member and acting between said bracket and said engaging means for normally urging said hammer member toward said gong; and

(h) a cam means connected to the motor drive shaft, said cam means being engageable with said engaging means for moving said hammer member away from said gong against the bias of said coil spring and disengageable with said engaging means for bringing said hammer member into striking contact with said gong under the action of said coil spring.

4,310,835

SECURITY EQUIPMENT INCLUDING TRIGGER CIRCUIT

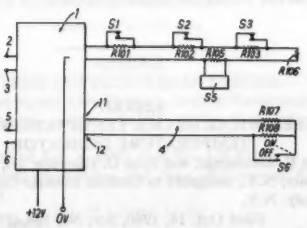
Philip C. Sefton, London, England, assignor to Donald Arthur Arnold, London, England

Filed Feb. 11, 1980, Ser. No. 120,644

Claims priority, application United Kingdom, Feb. 9, 1979, 04578/79

Int. Cl.³ G08B 25/00

U.S. Cl. 340—533 **10 Claims**



1. Security equipment comprising a detection circuit including a plurality of individual interconnected switch means adapted to be distributed about a premises to be guarded, each of said switch means having a resistance element connected thereacross so that operation of the respective switch means results in a change in the current flowing in said detection

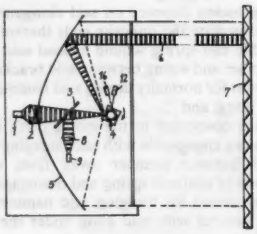
circuit, and a central control unit to which said detection circuit is connected, said control unit including an alarm, a trigger circuit connected to said detection circuit such that a change in said detection circuit corresponding to operation of one of said switch means results in the output from said trigger circuit rising from a quiescent level to a predetermined trigger level, an alarm circuit connected to the output of said trigger circuit and operable to energize said alarm whenever the output from said trigger circuit rises to said predetermined trigger level, and means for restoring the output of said trigger circuit to said quiescent level after a current change has occurred so that any subsequent current changes in said detection circuit are still able to trigger said alarm circuit.

4,310,836

PHOTOELECTRIC BARRIER, PARTICULARLY USEFUL AS AN ACCIDENT-PREVENTING DEVICE IN MACHINE TOOLS

Giuseppe Stanzani, Bologna, Italy, assignor to Datalogic S.p.A., Lippo di Caldera di Reno, Italy

Filed Aug. 14, 1979, Ser. No. 66,597
Claims priority, application Italy, Aug. 25, 1978, 3518 A/78
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—556 **4 Claims**



1. A photoelectric barrier, particularly useful as an accident-preventing device in machine tools comprising an emitter of a movable modulated beam constituted by a constant train of pulses, means for causing said beam to scan periodically at high rate an area to be protected, a photoelectric receiver receiving said pulses and effective to supply, in the presence of an obstacle in the area to be protected, a signal deactivating the machine tool, and a circuit generating pulses having a predetermined frequency, said pulse generating circuit being connected with said emitter so as to cause suppression of one or more of the pulses of the beam to effect the monitoring of the operation of the barrier during the scanning periods.

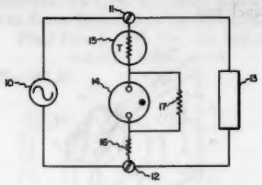
4,310,837

ELECTRICAL DEVICE TERMINATION HIGH TEMPERATURE INDICATOR

William P. Kornrumpf, and John D. Harnden, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 14, 1980, Ser. No. 196,457
Int. Cl.³ G08B *17/06*
U.S. Cl. 340—598 **30 Claims**

1. A high temperature indicator for an electrical power circuit connected to at least one termination, comprising:
on/off indicating means;
a thermistor electrically coupled in series with said indicating means across said power circuit, said thermistor being thermally coupled to said termination, and



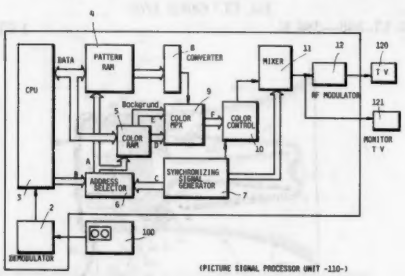
resistance means electrically coupled in parallel with said indicating means.

4,310,838

INSTRUCTION CONTROLLED AUDIO VISUAL SYSTEM

Hiromi Juso, Gose; Shigeki Tsuji, Tenri, and Shigemi Maeda, Sakai, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 3, 1979, Ser. No. 81,435
Claims priority, application Japan, Oct. 4, 1978, 53-123844; Oct. 5, 1978, 53-123202; Oct. 5, 1978, 53-123203; Dec. 29, 1978, 53-163355
Int. Cl.³ G06F *9/30*
U.S. Cl. 340—701 **46 Claims**



1. A video system for generating a visual display on a television screen, said system comprising:
a tape player reading picture data information from a tape, said picture data information including pattern data and color data;
first memory means for storing said pattern data therein;
second memory means for storing said color data therein;
means for combining said pattern data stored in said first memory means with color data stored in said second memory means to produce combined picture data;
means for converting said combined picture data produced by said means for combining into a video signal; and
television monitor means for converting said video signal into a visual display on said television screen.

4,310,839

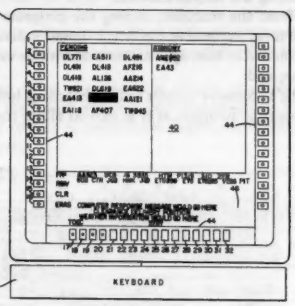
INTERACTIVE DISPLAY SYSTEM WITH TOUCH DATA ENTRY

Kurt R. Schwerdt, Bolton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 23, 1979, Ser. No. 97,012
Int. Cl.³ G09G *1/00*
U.S. Cl. 340—712 **8 Claims**

1. In combination:
means for displaying horizontal lines of data, said displaying means comprising an active tabular display device;

a plurality of switches connected to said device;
said switches being positioned in a substantially vertical column covering at least a portion of the peripheral surface area of the face of said tabular display device;



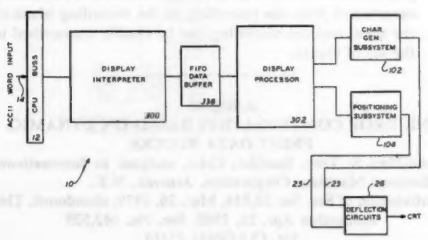
said switches being less than 150 mils thick; and
at least some of said switches being horizontally aligned with said horizontal lines of data for visual correspondence therewith.

4,310,840

TEXT-PROCESSING

Jonathan R. Williams, Dover, and Thomas D. Heidt, Long Valley, both of N.J., assignors to Vydec, Inc., Florham Park, N.J.

Filed Aug. 27, 1979, Ser. No. 69,986
Int. Cl.³ G09G *1/10*
U.S. Cl. 340—724 **16 Claims**



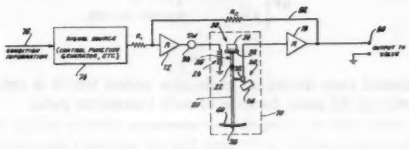
1. A system for processing textual material comprised of digital data words, certain words being representative of characters and certain words being representative of formatting instructions therefor, said system displaying said textual material on a display device, the displayed text including visible characters arranged in predetermined format by the non-displayed formatting instructions, which comprises:
means for decoding said data words and for identifying character data to be displayed and formatting data representative of modifications to said character data;
means, interconnected with said decoding means, for selectively combining formatting data words with character words by modifying said character data words;
means for controlling the positioning of characters on said display device as a function of said non-displayed formatting instructions; and
buffer means, interposed between said combining means and said positioning means, for passing said combined formatting and character data words from said combining means to said positioning means and for preventing the passage of digital data comprising solely instruction data words therebetween.

4,310,841

SIGNAL HANDLING APPARATUS

Everett O. Olsen, Wrentham, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Division of Ser. No. 641,075, Dec. 15, 1975, Pat. No. 4,123,696, which is a division of Ser. No. 543,443, Jan. 23, 1975, abandoned, which is a continuation of Ser. No. 333,997, Feb. 20, 1973, abandoned. This application Jul. 10, 1978, Ser. No. 923,009
Int. Cl.³ G08C *25/02*; G01R *1/14*; G05B *5/01*
U.S. Cl. 340—870.43 **19 Claims**



1. Manually-operated signal-controlling apparatus with memory means for retaining a signal level at a fixed (constant) value during times intervening changes in input magnitude, said apparatus comprising, in combination:
a member mounted for movement within a predetermined range by the application of a relatively light force;
actuator means forming an operative part of said movable member and including manually-operable means adapted to be grasped manually to permit the position of said member readily to be changed to any desired location with said range;
magnetic friction means coupled to said movable member to hold said member securely in position in the absence of a manually-applied force tending to shift its position, said magnetic friction means including a mass of small magnetized particles frictionally engaged with said member for continuously corresponding movement therewith to develop said friction force by surface contact between said member and the particles, said particles being supported to provide for movement relative to one another and also to accommodate movement of said member relative to said particles, said magnetic friction means serving to restrain the movement of said member with a force sufficient to hold said member firmly in position in the absence of said manually-applied force while permitting relatively easy manual changes in position of said member, with only light manual force required; and
position read-out means coupled to said movable member, said read-out means comprising sensing means in the form of a transducing device responsive to the positioning of said member within said predetermined range to produce for a remote utilization device a transmittable position signal having an energy-level characteristic the magnitude of which corresponds to the position of said member held in place by said magnetic friction means.

4,310,842

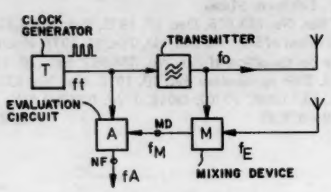
PULSED DOPPLER RADAR SYSTEM

Jürgen Siebeneck, and Uwe Feddern, both of Norderstedt, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1980, Ser. No. 119,911
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1979, 2907315
Int. Cl.³ G01S *13/04*
U.S. Cl. 343—5 PD **3 Claims**

1. A pulsed doppler radar system comprising a transmitter for transmitting pulse-shaped signals and a receiver having a mixing device to which the transmitter signal and a received transmitter signal reflected from a target are applied, also comprising an evaluation circuit connected to the mixing de-

vice, characterized in that the evaluation circuit is of such a construction that the output signal of the mixing device is



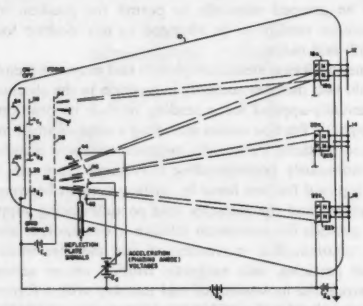
evaluated only during an evaluation period which is only a portion of the pulse duration of each transmitter pulse.

4,310,843

ELECTRON BEAM CONTROLLED ARRAY ANTENNA

Max N. Yoder, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 6, 1970, Ser. No. 24,937
Int. Cl.³ G01S *3/38*; H01Q *1/26*
U.S. Cl. 343—100 SA **9 Claims**



1. An array antenna and feed comprising:
a plurality of antenna elements;
a plurality of semiconductor diode devices equal in number to twice the number of said plurality of antenna elements, said plurlity of diode devices being arranged in pairs, each pair being connected to a different antenna element and
electron beam producing means for bombarding said pairs of semiconductor diode devices with modulated streams of high velocity electrons
whereby said array antenna radiates patterns which are related to the modulation of said electron streams.

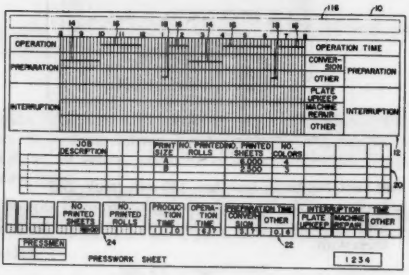
4,310,844

METHOD AND APPARATUS FOR DETECTING THE WORKING STATE OF A PRINTING PRESS OR THE LIKE

Tsunehiko Imamoto, Yokohama, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1980, Ser. No. 138,925
Claims priority, application Japan, Apr. 14, 1979, 54-45755
Int. Cl.³ G01D *9/00*
U.S. Cl. 346—1.1 **8 Claims**

1. A method of detecting the working state of a machine whose production time includes both operation time and downtime, the downtime being due to a plurality of possible causes, which method comprises:
placing on a recorder table a record medium in the form of a flat sheet having a set of blanks to be filled in to record the working state of the machine as well as an elongated signal recording blank;
providing a recording head having a recording member;
moving the recording head relative to the signal recording blank along the length thereof;
deriving from the machine, during the progress of its production time, successive electrical signals indicative of the operation and at least approximate downtime causes of the machine; and
sending the successive signals to the recording head to move the recording member, as it is moved along the length of



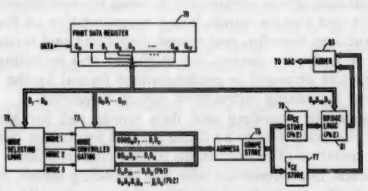
the recording blank, transversely to the length of the recording blank with different time intervals to record the signals in the recording blank along the length thereof with visually different shapes and dimensions, respectively, the recorded signals comprising essentially segments of line spaced apart differently lengthwise of the recording blank depending upon different signals; whereby the operation time, downtime, and at least approximate downtime causes of the machine can be visually ascertained from the recording in the recording blank of the sheet and the recording can be readily transcribed in the set of blanks.

4,310,845

INK DROP COMPENSATION BASED ON DYNAMIC, PRINT-DATA BLOCKS

Chein-Hwa S. Tsao, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 23,814, Mar. 26, 1979, abandoned. This application Apr. 21, 1980, Ser. No. 142,539
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—1.1 **17 Claims**



1. A method for reducing print errors in a charged drop ink jet printer where the flight of the drops is controlled by print data for the drops and such errors are due to distortions in the flight path of the drop to the print media, said method comprising the steps of:
monitoring the print data pattern of drops in the current stream of drops from the printer;
grouping one or more portions of the monitored data pattern into one or more blocks of data;

combining the data in each block of data into a code representative of the print data in the block;

selecting one of a plurality of modes of operation based on the monitored print data representing drops immediately preceding the drop being charged;

collecting into an address a combination of monitored data with or without codes from said combining step depending upon the mode of operation selected by said selecting step;

retrieving from a memory a stored compensation value based upon said address, said compensation value for use by the printer to correct the flight path of the drop being charged.

4,310,846

DEFLECTION COMPENSATED INK EJECTION PRINTING APPARATUS

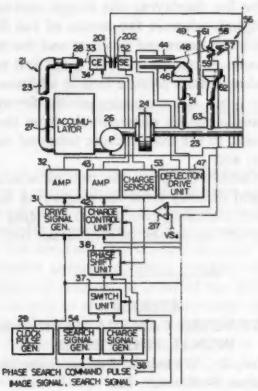
Masanori Horike, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

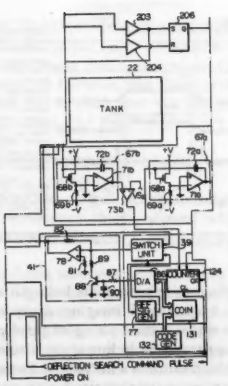
Filed Dec. 26, 1979, Ser. No. 106,806

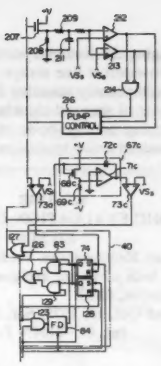
Claims priority, application Japan, Dec. 28, 1978, 53-164852; Dec. 30, 1978, 53-165187

Int. Cl.³ G01D *18/00*

U.S. Cl. 346—75 **18 Claims**







1. An ink ejection apparatus including ink ejection means for ejecting and charging ink and deflecting the ink from an ejection axis in a direction in response to a deflection signal, characterized by comprising:

velocity sensor means for sensing an ejection velocity of the ejected ink;

control means for controlling the ink ejection means to sweepingly vary the ejection velocity of the ink until the sensed ejection velocity is equal to a predetermined value;

target means spaced from the ejection axis in said direction;

hit sensor means for sensing impingement of the ink on the target means and producing a hit signal in response thereto; and

deflection sweep means for controlling the ink ejection means, after the control means adjusts the ejection velocity to the predetermined value, to sweepingly vary deflection of the ink until the hit sensor means produces the hit signal.

4,310,847

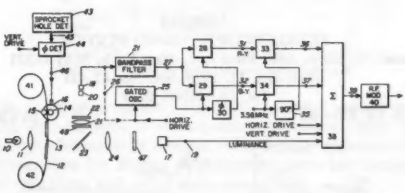
COLOR TELEVISION FILM SCANNING SYSTEM USING UNIFORM MOTION AND LINE ARRAYS

Hugh F. Frohbach, Sunnyvale; Albert Macovski, Menlo Park; Norman A. Peppers, Belmont; Thomas L. Siwecki, Walnut Creek, and Louis F. Schaefer, Palo Alto, all of Calif., assignors to World Development Laboratories, Los Angeles, Calif.

Filed Aug. 4, 1978, Ser. No. 930,984

Int. Cl.³ H04N *9/04*

U.S. Cl. 358—54 **12 Claims**



1. Apparatus for providing standard color television signals from a color image recorded as a series of frames on color film comprising:

a pair of photosensitive line arrays;

a repetitive array of color filters;

means for uniformly translating the film;

means for illuminating a portion of the film corresponding to a line in the color image;

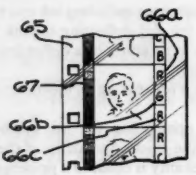
means for decomposing the light from the illuminated portion of the film into a first line image representing the luminance component of the decomposed light and a second line image which is filtered through the repetitive array of color filters along the image of the illuminated line;

means for imaging the first and second line images onto the pair of photosensitive line arrays;
means for simultaneously scanning the pair of line arrays to produce a pair of scanned signals; and
means for forming combinations of the scanned signals to produce standard color television signals.

4,310,848
COLORIMETRIC EVALUATION OF PHOTOGRAPHIC FILM

William D. Carter, Rancho Palos Verdes, and Martin S. Mueller, Torrance, both of Calif., assignors to Carter Equipment Co., Inc., Lawndale, Calif.

Filed Oct. 18, 1979, Ser. No. 86,177
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—76 **9 Claims**

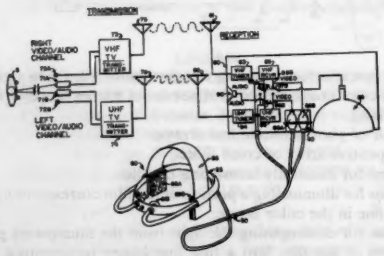


1. Apparatus for colorimetric evaluation of photographic film, comprising:
a variable light source producing a light beam;
means for applying said light beam to a negative strip of film to produce a negative visual image;
a color television camera cooperable with said light source for producing a first set of video signals representing said negative image;
electronic means associated with said camera and operable for inverting said first set of video signals to thereby produce a second set of video signals representing said image in a photographically positive form;
a color television monitor coupled to said electronic means and responsive to said second set of video signals for reproducing said image in a positive visual form; and
manually operable means for mechanically adjusting the chroma and intensity of said light beam so as to correct the color of said positive visual image.

4,310,849
STEREOSCOPIC VIDEO SYSTEM

Stuart M. Glass, 1487 First Ave., New York, N.Y. 10021

Filed Jun. 11, 1979, Ser. No. 47,603
Int. Cl.³ H04N *9/58*
U.S. Cl. 358—88 **14 Claims**



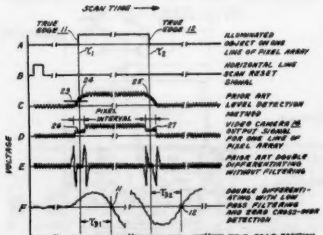
1. A headset for stereoscopic video viewing comprising:
a. video input means for directly coupling to a source of two different monoscopic video images to be viewed by a user corresponding to the different views by a human's eyes of an original object, the video input means comprising two optical coupling means each mountable over a different video image source and each having multiplex means including at least two output ports to enable the simultaneous viewing of the images thereof by more than one user at a given time;
b. flexible fiber optic means having releasable coupling means at one end for connecting same to one output port of each optical coupling means for separately transmitting the two different monoscopic video images side-by-side; and
c. video output means connected to the other end of the fiber optic means for directly coupling each of the two monoscopic video images to a different eye of the user and wherein the flexible fiber optic means provides a non-rigid connection between the video input and output means.

7. A stereoscopic video system comprising:
a. means receptive of two different frequency monoscopic video image carrier signals, corresponding to the different views by a human's eyes of an original object, for separately displaying the two monoscopic images, the displaying means comprising first and second receiving channels each including means receptive of one carrier signal for obtaining an audio and video signal therefrom and a cathode ray tube for displaying the image corresponding to the video signal, wherein the means of the first channel comprises a VHF tuner and receiver and the means of the second channel comprises a UHF tuner and receiver;
b. a main speaker, a main picture tube in addition to the two cathode ray tubes and switching means for applying the video and audio signals alternatively from the UHF and VHF channels, to the main picture tube and main speaker respectively; and
c. means for flexibly coupling the two monoscopic images separately and directly from the displaying means to the eyes of a user, including two optical coupling means each connected over the screen of a different one of the two tubes.

4,310,850
SOLID-STATE VIDEO CAMERA HAVING A VIDEO SIGNAL PROCESSOR

Richard J. Casler, Jr., Whitehall, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jul. 21, 1980, Ser. No. 170,338
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—107 **11 Claims**



1. In video imaging apparatus including a solid-state video camera having a quantized imaging array of pixels which outputs a video signal with a string of pixel-pulses per frame and noise, said apparatus including static scanner means for the video camera which outputs a horizontal line scan reset signal, a video signal processor synchronized with said reset signal for enhancing object edge resolution, comprising:
(a) a low pass filter for filtering the video output signal;
(b) first and second differentiators responsive to the low pass

filter output, at least one of the differentiators including another low pass filter;

(c) the combined time delay constant of said low pass filter means being approximately equal to at least one pixel interval, providing the object width is equal to at least two time constants;

(d) gated zero crossing detector means for detecting a zero crossing of the second differentiator output signal and outputting a variable gate pulse which precisely defines object true edge position relative said time constant; and

(e) timing reference means synchronized with the horizontal line scan reset signal and operative on the gated zero crossing detector means for controlling the occurrence of the variable gate pulse defining object true edge position.

4,310,851
SIGHTING DEVICE FOR REAR FIRING ON COMBAT AIRCRAFT

Jean Pierrat, Versailles, France, assignor to Avions Marcel Dassault-Breguet Aviation, Vaucresson, France

Filed May 22, 1979, Ser. No. 41,489
Claims priority, application France, May 22, 1978, 78 15060
Int. Cl.³ H04H *7/18*; F41G *1/06*
U.S. Cl. 358—109 **3 Claims**

1. Method of sighting for rearward firing on a combat aircraft carrying a rearwardly directed weapon arranged thereon for firing along an axis which is brought into firing alignment with a rearwardly positioned target by maneuvering the flight direction of the aircraft, said combat aircraft being equipped with a television camera pointing towards the rear and an electronic receiver situated in front of the pilot, said method comprising the step of connecting the output of said camera to the input of said receiver in such a way that the image delivered by the camera appears on the receiver in a position symmetrically opposite to the true rearward position of the target in relation to said firing axis, whereby the firing maneuvers needed to be carried out by the pilot to aim the aircraft at a rearwardly located object can be performed in accordance with the normal piloting reflexes for forward aiming.

4,310,852
REAL-TIME ELECTROMAGNETIC RADIATION INTENSITY DISTRIBUTION IMAGING SYSTEM

Gus P. Tricoles, San Diego, Calif., assignor to General Dynamics Corp., Electronics Division, San Diego, Calif.

Filed Apr. 8, 1980, Ser. No. 138,325
Int. Cl.³ H04N *5/30*
U.S. Cl. 358—110 **12 Claims**

1. A real time electromagnetic radiation intensity distribution imaging system, comprising:

an array of sensors for collecting electromagnetic radiation within a given frequency range, each of which is operable for producing a received signal in response to said collected radiation;

an array of transmitting antennas geometrically corresponding at a reduced scale to the array of sensors for transmitting electromagnetic radiation within the millimeter wave range;

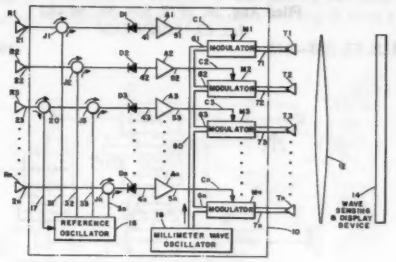
a branching network having a plurality of channels that individually connect the sensors to the transmitting antennas having corresponding positions in the respective arrays, said network comprising:

means for producing a reference signal that is temporally coherent with the received signals;

means in each channel for mixing each received signal with the reference signal to provide a coherent intensity signal in each channel;

means for producing a millimeter wave signal; and

means in each channel for modulating the millimeter wave signal with the intensity signal produced in such channel to provide intensity modulated millimeter wave signals for transmission from the transmitting antennas;



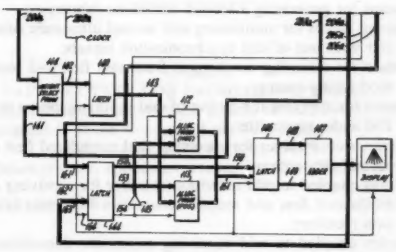
a lens for forming an image of the intensity distribution among the modulated millimeter wave signals transmitted from the array of transmitting antennas; and

means for sensing and displaying the intensity distribution image formed by the lens.

4,310,853
DATA SIMULATION IN SECTOR SCAN IMAGING SYSTEMS

Lawrence P. Madson, Littleton, Colo., assignor to Technicare Corporation, Solon, Ohio

Filed Jul. 30, 1980, Ser. No. 173,800
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—140 **10 Claims**



1. In an imaging system employing sequential radially extending discrete scans to form a composite sector image for display on a horizontally scanned video display, apparatus for simulating data for display at picture elements intermediate actual data along said radial scans comprising:

(a) a source of timing signals;

(b) means for identifying

(i) successive radial scan data picture elements in a horizontal display line, and

(ii) the void length therebetween, defined by the number of display picture elements horizontally between said radial scan data picture elements;

(c) means for evaluating the amplitude difference between said successive radial scan data picture elements; and

(d) memory means, responsive to said means for identifying, to said means for evaluating and to said timing signal, for storing and producing, in accordance with a predetermined weighting scheme, a simulated picture element value for each said display picture element along said horizontal void, said simulated elements being arrayed in

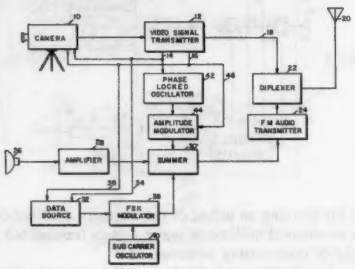
amplitude, in accordance with said predetermined weighting scheme, between the respective amplitudes of said successive radial scan data picture elements.

4,310,854

TELEVISION CAPTIONING SYSTEM

Ralph H. Baer, Manchester, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Aug. 24, 1979, Ser. No. 69,483
Int. Cl.³ H04N *7/04*
U.S. Cl. 358—143 **16 Claims**



1. A television system for transmitting and receiving coded data which can be received by a viewer and displayed on the receiving television receiver as readable alphanumerics, comprising:

a television transmitting system including a source of vertical and horizontal synchronization signals and an FM audio transmitter;

a data source;

means for generating a first ultrasonic subcarrier;

first means for modulating said first ultrasonic subcarrier with the output from said data source;

means for generating a second ultrasonic subcarrier;

second means for modulating said second ultrasonic subcarrier with one of said synchronization signals;

means for summing the outputs from said first and second modulating means;

means for applying the output of said summing means to the FM audio transmitter;

a television receiver for receiving said modulated first and second subcarriers;

means coupled to said television receiver for receiving said modulated first and second subcarriers from said television receiver;

means coupled to said receiving means for demodulating said first and second subcarriers; and

means coupled to said demodulating means for converting the coded data to alphanumerics displayed on the screen of the television receiver.

4,310,855

EFFICIENT MULTICHANNEL AUTOMATIC SETUP AND REMOTE CONTROL SYSTEM

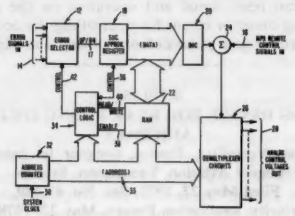
James R. Holzgrafe, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 31, 1980, Ser. No. 135,811
Int. Cl.³ H04N *5/24*
U.S. Cl. 358—210 **11 Claims**

1. An automatic setup system for the automatic local control of selected camera operating parameters of a camera apparatus in conjunction with a multiplexed remote control system which includes demultiplexer means, wherein the parameters exhibit error voltages, wherein each parameter is assigned a respective channel, and wherein the selected operating parameters may be both automatically and remotely controlled via the demultiplexer means and respective channels to correct the errors thereof, the combination comprising;

digital means including a selected memory for retrievably storing digital data representing the error correction required for each selected operating parameter;

digital-to-analog converter means coupled to the digital means and memory for selectively generating a local analog control voltage commensurate with the automatic error correction for each selected operating parameter;



analog summing means coupled at its inputs to the converter means and to the multiplexed remote control system and at its output to the demultiplexer means, to sum the respective analog remote and local control voltages therefrom to provide a resulting composite control voltage for correcting the error of each parameter; and

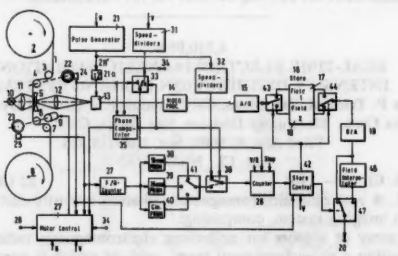
control means integral with the camera apparatus coupled to the digital means and memory, and to the demultiplexer means, to synchronously select the channels and thus the respective operating parameters.

4,310,856

METHOD AND APPARATUS FOR THE TELEVISION SCANNING OF FILMS

Dieter Poetsch, Ober-Ramstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 21, 1980, Ser. No. 151,781
Claims priority, application Fed. Rep. of Germany, May 30, 1979, 2921934
Int. Cl.³ H04N *3/36*
U.S. Cl. 358—214 **23 Claims**



1. In a method for the television scanning of a film wherein the film is scanned line by line without interlacing, the signals which belong respectively to a scanned line are read into a frame store (16; 17, 18) at an address characterizing the position of the particular line within a film frame and the content of the frame store is read out in accordance with the television standard, the improvement comprising the steps of

producing the address by counting pulses derived from the line and frame frequency of the television standard at film speeds at which the ratio of the field frequency of the television standard to the number of film frames scanned

per unit time is a whole number multiple, or in coupled operation;

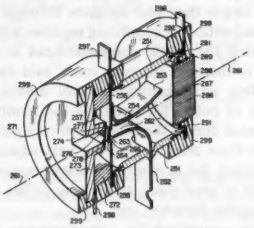
and producing the address by counting pulses which are produced by means sensing the position of the film at other film speeds, or in uncoupled operation.

4,310,857

PROXIMITY FOCUSED STREAK TUBE AND CAMERA USING THE SAME

Albert J. Lieber, 107 Bandolier Ave., and Howard D. Sutphin, 112 Shirlane Pl., both of Los Alamos, N. Mex. 87544

Filed Sep. 19, 1977, Ser. No. 834,466
Int. Cl.³ H04N *5/30*
U.S. Cl. 358—217 **6 Claims**



1. In a proximity focused streak tube, a photocathode for converting photon images into photoelectrons, a phosphorous screen for receiving said photoelectrons, said photocathode and said screen for receiving said photoelectrons, said photocathode and said screen defining a longitudinal tube axis, a channel plate having a plurality of substantially parallel bores therein, the channel plate being disposed in close proximity to the photocathode so that the bores in the channel plate are inclined at an angle with respect to the longitudinal tube axis, means for applying a voltage differential between the photocathode and the channel plate to cause electrons to be extracted from the photocathode and to travel in paths through the bores in said channel plate to said phosphorous screen, said bores in said channel plate being arranged so that said photons and photoelectrons cannot pass directly from said photocathode directly through said channel plate to said phosphorous screen, first and second spaced apart beam electrodes disposed on opposite sides of the tube axis between the channel plate and the phosphorous screen and having curved profiles, one of said beam electrodes being curved away from the tube axis at an angle which is progressively greater in a direction away from the channel plate than that of the other beam electrode and means for applying a voltage differential between said beam electrodes to cause the photoelectrons to move in directions across the screen, said beam electrodes being arranged asymmetrically of the tube axis to compensate for the inclination of the bores in the channel plate with respect to the tube axis.

4,310,858

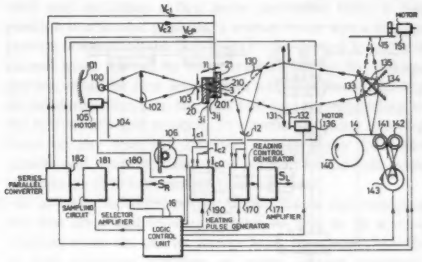
TELECOPYING PROCESS EMPLOYING A CELL HAVING A SMECTIC LIQUID CRYSTAL AND A TRANSMITTER-RECEIVER TELECOPIER EMPLOYING SAID PROCESS

Michel Hareng; Serge Le Berre, and Pierre Leclerc, all of Paris, France, assignors to Thomson-CSF, Paris, France

PCT No. PCT/FR78/00044, § 371 Date Aug. 1, 1979, § 102(e) Date Aug. 1, 1979, PCT Pub. No. WO79/00333, PCT Pub. Date Jun. 14, 1979
PCT Filed Nov. 30, 1978, Ser. No. 129,972
Claims priority, application France, Dec. 1, 1977, 77 36223
Int. Cl.³ H04N *1/24*
U.S. Cl. 358—302 **4 Claims**

1. A telecopying process for inscribing each transmitted page in the form of successive rectilinear segments of N dots wherein the writing-in of each segment comprises the following steps:

a step of intermediate writing-in of the N dots, in rectilinear alignment in a layer including a mesomorphic material having a smectic phase, in the form of Q successive under segments of P simultaneous dots, the product P×Q being equal to N and Q being integer at least equal to one; the intermediate writing-in of each under-segment being preceded by a temporary heating of the part of the layer intended for receiving said intermediate writing-in from a



first temperature in the range where said material is in smectic-phase to a second temperature higher than this range and being accomplished during the subsequent cooling of this same part from the second to the first temperature;

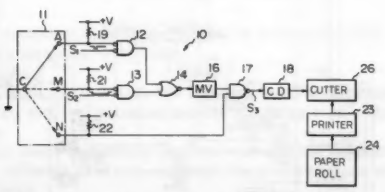
a step of definitive writing-in during which the meomorphic material is uniformly in smectic phase, and the Q under segments intermediately recorded in said layer are simultaneously projected onto a layer of a photosensitive material.

4,310,859

PAPER CUTTER FOR FACSIMILE APPARATUS

Shuichi Takahashi, and Mitsuru Kondo, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 6, 1980, Ser. No. 194,301
Claims priority, application Japan, Oct. 20, 1979, 54-134734
Int. Cl.³ H04N *1/31*
U.S. Cl. 358—304 **3 Claims**



1. A facsimile reception apparatus including printing means for reproducing received facsimile images on a continuous roll of paper and cutter means for cutting the paper in response to a cut signal, characterized by comprising:

first means for generating the cut signal in response to an end of recording of a single facsimile image;

second means for generating the cut signal in response to an end of recording of a plurality of facsimile images; and

switch means for selectively enabling one of the first and second means.

4,310,860
METHOD AND APPARATUS FOR RECORDING DATA ON AND READING DATA FROM MAGNETIC STORAGES

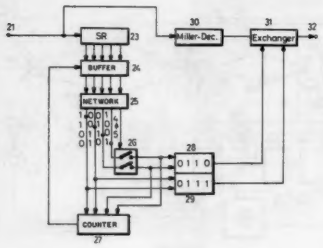
Hans-Richard Leiner, Griesheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 25, 1979, Ser. No. 52,127

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1978, 2828219

Int. Cl.³ G11B 5/09

U.S. Cl. 360—40 **11 Claims**



1. Method for eliminating the DC component in the transmission of a sequence of data bits coded in a code wherein predetermined combinations of sequential data bits create a DC component, comprising the steps of

scanning said sequence of data bits to locate a predetermined number n of sequential data bits together creating a DC component; and

transmitting a sequence of substitute bits together creating no DC component instead of said predetermined number of sequential data bits.

4,310,861
DATA-RECORDING DEVICE

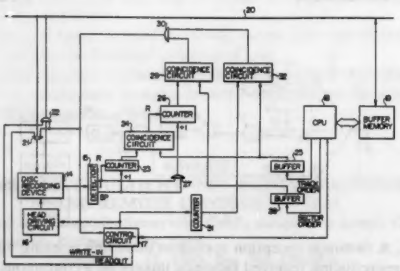
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 920,719, Jun. 30, 1978, which is a continuation of Ser. No. 712,532, Aug. 9, 1976, abandoned. This application Sep. 4, 1979, Ser. No. 71,859

Claims priority, application Japan, Aug. 11, 1975, 50-97348/75; Dec. 26, 1975, 50-158628

Int. Cl.³ G11B 5/09

U.S. Cl. 360—50 **1 Claim**



1. A data-recording device for substantially continuously reading and/or writing data on tracks of a magnetic disc recording medium, comprising:

a rotatable magnetic disc recording medium having a recording surface which has an index showing a rotation reference position and which has a plurality of adjacent concentric circular tracks to be scanned in predetermined order, each track having a starting position and a distinctive serial number, said recording medium comprising a plurality of sectors on said disc;

a single magnetic head disposed so as to face the recording surface of the rotatable magnetic disc recording medium and to scan the tracks thereof;

drive means for shifting the single magnetic head in the radial direction of the magnetic disc recording medium for scanning the tracks by the single magnetic head in said predetermined order;

a source of pulses having a predetermined repetition rate;

data writing means for writing a starting position data into each of the tracks at the respective starting position thereof which is spaced behind and from that of the immediately preceding track by a circumferential angular distance larger than that distance through which the rotatable magnetic disc recording medium is rotated during the time that the single magnetic head is shifted from one track to the next adjacent track, said data writing means including an electronic control means coupled to said source of pulses for counting the number of said pulses generated during the time that the single magnetic head is shifted from one track to the next adjacent track and for comparing the number of pulses counted with the serial number of each track, to thereby define said circumferential angular distance; and

means for controlling the data writing to, and data reading from, each of the tracks, by detecting the starting position data written on each of the tracks.

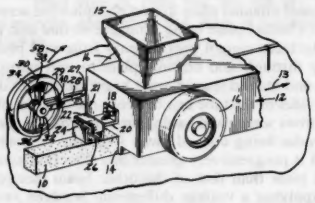
4,310,862
MAGNETIC CONTROL STRIP RECORDING DEVICE FOR ROADWAY CONTROL SYSTEM

Alfred V. Schwarz, P.O. Box 425, Winnipeg, Manitoba, Canada (R3C 2H6)

Continuation-in-part of Ser. No. 65,084, Aug. 9, 1979, abandoned. This application Oct. 26, 1979, Ser. No. 88,604

Int. Cl.³ G11B 5/02, 5/00

U.S. Cl. 360—68 **18 Claims**



1. Apparatus for impressing a magnetic pattern into a magnetizable road surface material deposited by road surface laying equipment and for use in the control of vehicles passing thereover comprising:

(a) a magnetic core;

(b) means attached to said equipment for holding said core proximate said material;

(c) an electromagnetic coil proximate said core and operable when energized for inducing a magnetic field through said core;

(d) a wheel for rotating in response to movement of said equipment along the ground;

(e) means securing said wheel to said equipment; and

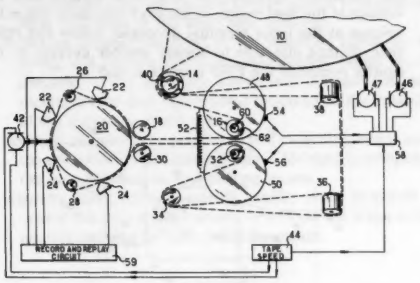
(f) switching means operatively associated with said wheel and responsive to the rotation thereof to establish alternating magnetic fields in said coil at periodic points in said movement to impress a magnetic pattern in said road material.

4,310,863

MAGNETIC TAPE RECORDERS

Guy Lelandais, Bures sur Yvette, France, assignor to Enertec, Montrouge, France

Filed May 4, 1979, Ser. No. 35,972
Int. Cl.[3] G11B *15/60, 15/43, 15/26*
U.S. Cl. 360—90 9 Claims



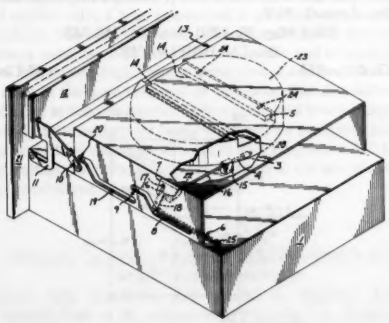
1. A magnetic tape recorder comprising tape supply means and take-up means, means for guiding the tape along a predetermined path between said tape supply and take-up means, at least one tape head adapted for engagement with said tape at a location of said path, and means adjacent said location for driving tape along said path, said guiding means including at least two rollers positioned in said path respectively before and after said tape head, respective movable members carrying the rollers, and servo drive means for controlling the positions of said movable members thereby to absorb substantial variations in tape tensions and maintain tape tension at a constant value, said rollers having resilient surfaces designed to absorb vibration energy of the tape thereby to reduce flutter.

4,310,864

CARTRIDGE LOADING AND UNLOADING MECHANISM

Dilip C. Patel; John D. Stricklin, both of Oklahoma City, Okla., and Bruno Koehne, Casselberry, Fla., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Jun. 4, 1979, Ser. No. 45,484
Int. Cl.[3] G11B *5/012*
U.S. Cl. 360—97 6 Claims



1. In a disk memory drive of the type having a deck on which a rotatable drive spindle is accessible for magnetic coupling thereto of the disk hub contained in a replaceable disk module, a carrier frame, tracks mounting the carrier frame slidingly on the deck, said carrier frame supporting the module and slidingly conveying it between a position enabling the spindle to hub coupling and a position adjacent a module removal port, said tracks having ramp sections for lifting the carrier frame-supported module and detaching its hub from the spindle during movement of the carrier frame from the spindle to the port, and wherein said tracks and carrier frame incorporate a predetermined amount of free travel between the position of the carrier frame enabling the spindle to hub coupling and the onset of traversal of the tracks' ramp sections, an improvement for reducing the force needed for shifting the carrier frame along the tracks to break the disk hub from the spindle coupling, comprising:

(a) a lift mechanism mounted on the deck and at least partially between the deck and the module surface facing the deck and including a first lever moveable from a first position to a second position, a second lever, and a linkage portion connecting the first lever to the second lever, said second lever moved by force transmitted by the linkage portion from the first lever, from a first position exerting no substantial force on the disk hub and corresponding to the first lever's first position, to a second position exerting force on the disk hub directed axially away from the spindle and corresponding to a position of the first lever between its first and second positions; and

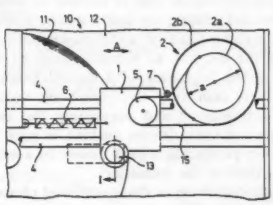
(b) an actuator mounted on the carrier frame and engaging the first lever and moving it from its first to its second position when the carrier moves from its extreme spindle to hub coupling position to ramp section traversal, whereby the forces on the disk hub created by the second lever's and the carrier's movement combine to detach the hub from the spindle.

4,310,865

CABLE POSITIONER FOR A SCANNING HEAD

Lambert Kohl, Wachenheim; Udo Boehm, and Klaus Schulze-Berge, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 17, 1980, Ser. No. 113,045
Claims priority, application Fed. Rep. of Germany, Feb. 10, 1979, 2905074
Int. Cl.[3] G11B *21/08*
U.S. Cl. 360—106 5 Claims



1. A positioner for a scanning head in a recording and/or playback apparatus, comprising:

a chassis;

a carriage which carries the scanning head, said carriage being mounted for linear movement relative to said chassis;

pulley means including at least two coaxial pulley elements of different diameter, mounted for co-rotation on said chassis;

a cable the ends of which are attached to said two pulley elements, respectively,

said carriage having a cable engaging element around which said cable is looped;

tensioning means attached to said carriage to produce a tension in the loop of said cable; and

a motor for driving said pulley means

so as to wind the cable on, and unwind the cable from, said two coaxial elements, respectively, and hence effect linear movement of said carriage and said head, the difference in

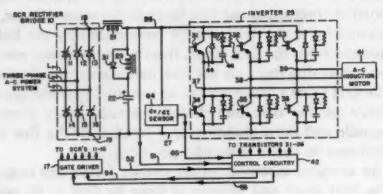
diameter of the two pulley elements determining the precision of said linear movement.

4,310,866

SHOOTTHROUGH FAULT PROTECTION SYSTEM FOR BIPOLAR TRANSISTORS IN A VOLTAGE SOURCE TRANSISTOR INVERTER

William F. Wirth, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 28, 1979, Ser. No. 79,855
Int. Cl.³ H02H *7/122*
U.S. Cl. 361—88 **3 Claims**



1. A shoottthrough fault protection system for a voltage source transistor inverter driven by a d-c bus voltage received over a d-c bus from a d-c voltage source having a shunt-connected filter capacitor, where the inverter includes, series-connected across the d-c bus, at least one pair of power bipolar transistors which are subject to undesired shoottthrough fault current caused by the discharging of the filter capacitor through the emitter-collector conduction paths of the transistors whenever the transistors are inadvertently conductive at the same time thereby short-circuiting the d-c bus, said protection system comprising:

protection means, including a choke in series with the filter capacitor, for effectively shaping the load lines of the faulted transistors, during a shoottthrough fault, to avoid entering the second breakdown area, thereby preventing second breakdown destruction of the transistors,

said choke limiting the rate of increase of shoottthrough fault current and causing the fault current to increases linearly along a ramp function and causing the d-c bus voltage, across the d-c bus, to instantly drop to essentially zero volts at the beginning of a shoottthrough fault, thereby effectively removing any significant voltage across the faulted transistors and preventing the emitter-collector voltage and the collector current, in each faulted transistor, from producing a peak power of a magnitude which would destroy the transistor;

a fast recovery diode in shunt with said choke to clamp said d-c bus to the filter capacitor voltage and to provide a discharge path for the inductive energy developed in said choke; and

means, responsive to a shoottthrough fault, for removing the base drive from the faulted transistors to effect turn-off thereof.

4,310,867

VOLTAGE RESPONSIVE SWITCH WITH INPUT VOLTAGE SURGE PROTECTION

John R. Shreve, Kokomo, and Wesley A. Vincent, Bringhurst, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 29, 1980, Ser. No. 191,360
Int. Cl.³ H02H *3/20*; H03K *5/153*
U.S. Cl. 361—90 **2 Claims**

1. A monolithic integrated circuit voltage responsive switch having input voltage transient protection comprising, in combination:

positive and negative voltage supply terminals;

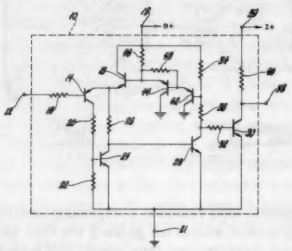
input and output terminals;

a PNP transistor having base, emitter and collector regions;

means including a resistance element effective to couple the input terminal to the base region of the PNP transistor;

means effective to generate a switching level reference voltage;

a high gain voltage responsive current source responsive to the difference between the reference voltage and the voltage at the base region of the PNP transistor when the voltage at the input terminal decreases below the reference voltage effective to supply emitter current to the emitter region of the PNP transistor; and



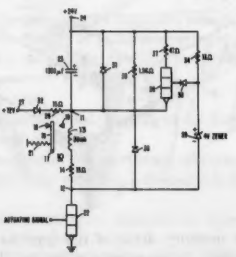
output circuit means responsive to the conduction state of the PNP transistor effective to supply a bi-level output signal to the output terminal in accord with the relationship between the input voltage at the input terminal and the reference voltage, the high gain voltage responsive current source and the resistance element tending to maintain the voltage at the base region of the PNP transistor at the switching level reference voltage to prevent the base region of the PNP transistor from becoming more negative than the negative voltage supply terminal in response to a negative voltage transient at the input terminal to thereby prevent damage to the monolithic integrated circuit voltage responsive switch in response to the negative voltage transient.

4,310,868

FAST CYCLING, LOW POWER DRIVER FOR AN ELECTROMAGNETIC DEVICE

James B. Lillie, Longmont, and James L. Sanford, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 30, 1980, Ser. No. 154,743
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—154 **20 Claims**



1. A circuit for actuating an electromagnetic device at a rapid cycling rate in response to an actuating signal by utilizing energy from a high energy source and a low energy source comprising:

picking means, electrically connected between the high energy source and said device, for actuating said device by coupling the high energy source to said device for a short time interval until said picking means fills with energy;

holding means, electrically connected between the low energy source and said device, for maintaining said device actuated by coupling the low energy source to said device after expiration of the short time interval;

switching means responsive to the actuating signal for enabling said picking means and said holding means for the duration of the actuating signal, and for disabling said picking means and said holding means upon the cessation of the actuating signal; and

deenergizing means responsive to said switching means upon the cessation of the actuating signal, for rapidly dissipating the energy stored in said picking means

whereby said picking means is rapidly made available to couple the high energy source to said device when subsequently enabled by said switching means.

4,310,869

ELECTRIC FENCE ENERGIZER OUTPUT CONTROL CIRCUITS

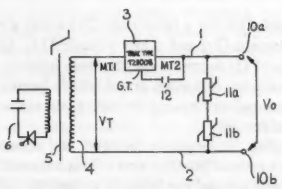
Rex C. G. Niven, Hamilton, New Zealand, assignor to Gallagher Electronics Limited Company, Melville, New Zealand

Filed Mar. 14, 1980, Ser. No. 130,446

Claims priority, application New Zealand, Mar. 21, 1979, 189958

Int. Cl.³ H01T *20/00*

U.S. Cl. 361—232 **6 Claims**



1. An electric fence energizer output control circuit to which is applied an output voltage from an electric fence energizer which voltage comprises sequential pulses having a short duration high voltage period and a longer duration low voltage period of opposite polarity, said control circuit comprising first and second rails, a triac connected in said first rail by the main terminals thereof, said triac being conductive during high voltage pulse periods, means to sense the end of said current flow due to said high voltage pulse period and to cause current to flow in the gate terminal of said triac thereby maintaining said triac in the conductive state during said low voltage pulse period, the arrangement being such that on the application of a relatively low voltage and relative low frequency AC sinusoidal voltage to the output of said control circuit said triac is non-conductive to said AC voltage.

4,310,870

CHASSIS CAPTIVATION ARRANGEMENT FOR AN ELECTRONIC DEVICE

Mansor Kia, Lombard, and Harold G. Hanley, Arlington Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1979, Ser. No. 108,864

Int. Cl.³ H05K *7/16*

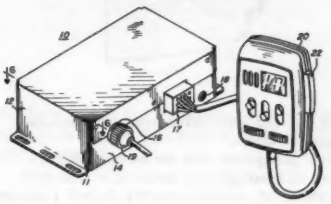
U.S. Cl. 361—415 **12 Claims**

1. A chassis captivation arrangement for an electronic apparatus comprising in combination:

a chassis bracket having means for attaching in parallel a pair of printed circuit boards, said bracket formed from a planar strip and having a configuration when viewed from the strip edge comprising three linear segments;

said bracket having flange means positioned at two nonadjacent linear segments thereof and said bracket having upper and lower support tab means positioned adjacent said flange means, said support tab means extending a length substantially greater than the thickness of a printed circuit board;

first and second separable housing portions, said first housing portion including integrally formed entrapment members slidably interfitting with said flange means to captivate transversely said chassis within said first housing portion, said lower support tab means also contacting said first housing portion to provide vertical support for said chassis;



said second housing portion interlocking with said first housing portion and being adapted to contact said upper support tab means to captivate said chassis arrangement vertically between said first and second housing portions when joined,

whereby said chassis arrangement is enclosed and captivated transversely and vertically within said joined interlocking housing portions.

4,310,871

ILLUMINATING DEVICE FOR INSTRUMENT

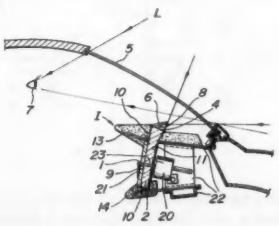
Masahiro Adachi, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Nov. 1, 1979, Ser. No. 90,474

Claims priority, application Japan, Nov. 6, 1978, 53-135715; Nov. 14, 1978, 53-139300

Int. Cl.³ G01D *11/28*

U.S. Cl. 362—23 **7 Claims**



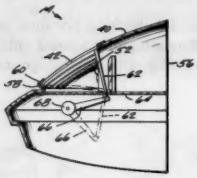
1. An illuminating device for an instrument used in an automotive vehicle comprising a light guiding member arranged at the rear side of a dial mounted at the front surface of the instrument and formed of a transparent plate, liquid crystal or the like, the light guiding member being provided with a light introducing portion facing outside of the vehicle onto which outside light falls, a light guide portion, an illuminating portion closely arranged with the backside of the dial, and an internal light source embedded in part of said member, so that the dial may be illuminated for indication by either of the outside light and the internal light.

4,310,872

AUTOMOBILE FRONT END UNIT

Henry de S. Lauve, Troy, Mich., assignor to Electric Fuel Propulsion Corp., Troy, Mich.

Filed Oct. 23, 1979, Ser. No. 87,621
Int. Cl.[3] B60Q *1/00*
U.S. Cl. 362—82 8 Claims



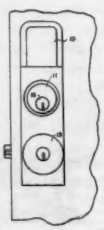
1. A unitized automotive front end, including:
a bumper means;
a shell juxtaposed with the bumper means;
a pair of headlight sets mounted in said shell;
a translucent, aerodynamically-shaped, transversally extensive airfoil mounted on said shell and normally covering both said headlight sets by extending forwardly and downwardly in an arch which passes in front of both said headlight sets;
said translucent airfoil having intermediate the left and right ends thereof two transversally spaced headlight cover panels, each having a forward, lower edge hinged by hinge means with respect to said shell, in order to permit the cover panels to be rotated down so that the headlight sets may shine out of the shell over what normally would be the exterior surfaces of said headlight cover panels; and
adjustable strut means normally holding said cover panels up in line with the remainder of said translucent airfoil, but operable to rotate said panels downward about said hinge means.

4,310,873

KEY HOLE LIGHT ILLUMINATOR

Stanley R. Bean, 2067 Lake Club Tr., Columbus, Ohio 43227

Continuation of Ser. No. 913,215, Jun. 6, 1978, abandoned. This application Mar. 24, 1980, Ser. No. 133,114
Int. Cl.[3] E05B *17/10*
U.S. Cl. 362—100 5 Claims



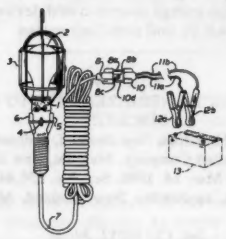
1. A unitized structure for illuminating a point-source area, such as a key hole, comprising:
a housing for mounting adjacent said area;
electrical components for providing said illumination fixedly positioned within said structure;
a cover of resilient material removably positioned in sealing engagement with said structure;
said electrical components further including a switch having an oversize contact positioned adjacent the inside wall of said resilient cover;
a voltage cell and an illuminator interconnected and disconnected by said switch; and
a timer associated with said switch to connect said voltage cell to said illuminator for a present time and thereafter disconnect the same.

4,310,874

GROUNDED DUAL VOLTAGE TROUBLE LIGHT AND EXTENSION CORD

Joseph Spiteri, P.O. Box 158, Harborcreek, Pa. 16421

Filed Feb. 22, 1980, Ser. No. 123,700
Int. Cl.[3] F21V *23/04;* H01R *11/00*
U.S. Cl. 362—251 3 Claims

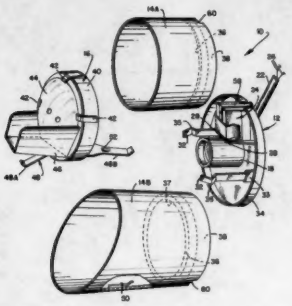


1. A dual voltage trouble light and extension cord comprising
a lamp holder (6) for a lamp bulb (2) having a high voltage A.C. filament (2*a*) and a low voltage D.C. filament (2*b*)
a lamp guard (3) mounted on the lamp holder,
a four conductor extension cored set (7) having a first plug (8) at one end and having the other end connected to said lamp holder (6),
said first plug (8) having a first (8*c*) and second (8*b*) A.C. prongs, a ground pin (8*a*), and a female connector (8*d*), the prongs and ground pin being in grounded socket configuration,
the first conductor (9*a*) of said cord set connected from said ground pin (8*a*) to a first terminal (3*a*) in said lamp holder connected to said lamp guard (3),
the second conductor (9*c*) of said cord set connected from the first prong (8*c*) to a second terminal (2*e*) in said lamp holder connected to one end of said high voltage filament (2*a*),
the third conductor (9*d*) of said cord set connected from said female connector (8*d*) to a third terminal (2*d*) in said lamp holder connected to one end of said low voltage filament (2*b*),
the fourth conductor (9*b*) of said cord set connected from the second prong (8*b*) to a fourth terminal (2*c*) in said lamp holder connected to the other ends of said filaments (2*a*, 2*b*),
a two pole switch in said lamp holder, one pole (4*e*) controlling the circuit in said second conductor (9*c*) to said second terminal (2*e*) and the other pole (4*d*) controlling the circuit in said third conductor (9*d*) to said third terminal (2*d*),
a battery voltage socket (5) in said lamp holder having a ground contact (5*a*) connected to said first terminal (3*a*) and power contacts (5*c*, 5*d*) connected respectively to said third (2*d*) and fourth (2*c*) terminals,
and an A.C. voltage socket (6) in said lamp holder having a ground contact (6*a*) connected to said first terminal (3*a*) and power contracts (6*c*, 6*b*) connected respectivelv to said second (2*e*) and fourth (2*c*) terminals.

4,310,875
UNIVERSALLY ADJUSTABLE LAMP FIXTURE

Edison A. Price, New York, N.Y., assignor to Edison Price, Incorporated, New York, N.Y.

Filed Jun. 18, 1979, Ser. No. 49,360
Int. Cl.³ F21V *21/26*
U.S. Cl. 362—277 4 Claims



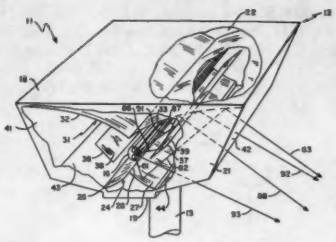
1. A universally adjustable lamp fixture comprising:
a base plate for supporting a lamp;
a lamp shield for directing light from the lamp;
a lens assembly including a lens for focussing and modifying the distribution of light from the lamp;
complementary formed releasable interconnect means on said base plate and said shield for releasably connecting together said shield and said base plate, said interconnect means comprising a forwardly extending peripheral rim on said base plate forming a socket to receive said lamp shield therein, at least a pair of spring biased clip on said base plate extending forwardly therefrom, said clips having outwardly extending bends adjacent their respective end, and an engagement ring circumferentially disposed on and extending inwardly from the inner surface of said shield, said ring defining an opening having a radius smaller than the distance between the outer bends of said clips whereby said outer bends of said clips overlie and abut said ring to retain said lamp shield on said base and permit relative rotation therebetween, said clips being adapted to be moved toward each other until said outer bends clear said ring to permit separation of said lamp shield and said base plate;
a spring tab on said base plate;
and a notch in said lamp shield adapted to releasably receive said tab therein to lock said light shield in a desired orientation and prevent relative rotation between said light shield and said base plate.

4,310,876
LIGHTING FIXTURE AND METHOD USING MULTIPLE REFLECTIONS

Edward A. Small, Jr., 2255 E. Haven Dr., Santa Rosa, Calif. 95404, and Ian Lewin, 11408 St. Andrews Way, Scottsdale, Ariz. 85254

Continuation of Ser. No. 920,725, Jun. 30, 1978, abandoned.
This application Mar. 17, 1980, Ser. No. 131,071
Int. Cl.³ F21V *7/00*
U.S. Cl. 362—298 2 Claims

1. In a method for producing light at a high angle from a lighting fixture with an open side and having a lamp therein, providing first and second reflectors having a metal layer and a multi layer high reflectivity coating carried on the metal layer and formed of materials having high and low indices of refraction to provide a reflectivity which does not fall below 95% for any light angle positioning said first and second reflectors on opposite ends of the lamp so that direct rays from the lamp are reflected by the first reflector to the second reflector and so that light impinging on the second reflector is reflected through the open side at a high angle of 70° and greater with respect to vertical and thereby reducing the quantity of direct

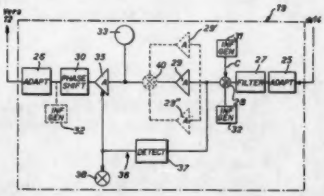


light from the light fixture and increasing the light emitted from the lighting fixture at the high angle so as to reduce glare from the lighting fixture.

4,310,877
MONITORING DEVICE FOR REGULATING ANY SEQUENCE OF AUTOMATIC OPERATIONS IN AN INDUSTRIAL PLANT

Louis Richaud, Paris, France, assignor to Comsip Entreprise, Rueil Malmaison, France

Filed Sep. 26, 1979, Ser. No. 79,049
Claims priority, application France, Sep. 28, 1978, 78 27792
Int. Cl.³ G05B *6/02, 9/02, 11/01*
U.S. Cl. 364—159 2 Claims



1. A monitoring device for use in regulating a sequence of automatic operations normally controlled by a feedback control loop, said monitoring device being adapted to be substituted for the feedback control loop for introducing oscillations in the sequence of automatic operations and comprising an amplifier with an adjustable proportional gain, an adjustable pure phase shift member whereby said monitoring device provides a corresponding phase shift in the sequence of automatic operations without any concomitant variation of gain, another amplifier with programmed gain controlled by a safety loop, said safety loop being connected upstream of the first-mentioned amplifier and comprising an amplitude detector with which a threshold relay is associated, and said safety loop being governed by an alarm device.

4,310,878

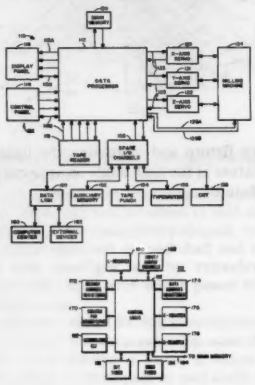
DIGITAL FEEDBACK CONTROL SYSTEM

Gilbert P. Hyatt, P.O. Box 4584, Anaheim, Calif. 92803

Continuation-in-part of Ser. No. 879,293, Nov. 24, 1969, abandoned, Ser. No. 101,881, Dec. 28, 1970, Ser. No. 134,958, Apr. 19, 1971, Ser. No. 135,040, Apr. 19, 1971, Ser. No. 229,213, Apr. 13, 1972, Pat. No. 3,820,894, Ser. No. 230,872, Mar. 1, 1972, and Ser. No. 232,459, Mar. 7, 1972. This application Apr. 24, 1972, Ser. No. 746,867

Int. Cl.[2] G05B *1/01*; G06F *15/46*

U.S. Cl. 364—183 **9 Claims**



1. A feedback system comprising:

a feedback device for generating a repetitive signal having a repetitive signal characteristic that is related to a feedback condition, wherein said feedback device includes an excitation circuit for generating a repetitive excitation signal and further includes an electromagnetic transducer for generating the repetitive signal in response to the excitation signal, and wherein the repetitive signal characteristic is a transition between states;

a detection circuit for generating a detection signal in response to the transition between states of the repetitive signal;

a reference circuit for generating a reference signal; and

an output circuit for providing a digital feedback number in response to the detection signal and the reference signal, wherein said output circuit includes a counter for generating the digital feedback number related to a time difference between the detection signal and the reference signal.

4,310,879

PARALLEL PROCESSOR HAVING CENTRAL PROCESSOR MEMORY EXTENSION

Arun K. Pandeya, 1620 Worcester Rd., Framingham, Mass. 01701

Filed Mar. 8, 1979, Ser. No. 18,476

Int. Cl.[3] G06F *7/42, 7/44, 9/28, 13/00*

U.S. Cl. 364—200 **19 Claims**

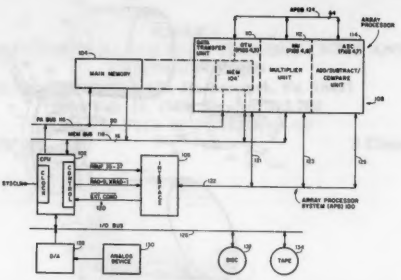
1. In a digital data processing system including a CPU and a main memory consisting of a first memory portion and a second memory portion, a parallel processor, first bus means for connecting said parallel processor between said CPU and said first memory portion, said parallel processor comprising:

comprising means for permitting to connect said second memory portion to said first memory portion;

first means for transferring data over said first bus means from said first memory portion to said second memory portion for storage therein;

means for arithmetically manipulating said data stored in said second memory portion to achieve arithmetically manipulated data; second bus means connected between said manipulating means and said second memory portion for transferring said data stored in said second memory portion to said manipulating means and for transferring said arithmetically manipulated data to said second memory portion; and

said first transferring means including other means for transferring certain of said arithmetically manipulated data over said first bus means and from said second memory portion to said first memory portion for storage therein,



whereby said CPU may operate on data stored data in said first memory portion without interference from said arithmetic manipulating means and whereby said arithmetic manipulating means may operate on data stored in said second memory portion without competing intereference from said CPU, said CPU and arithmetic manipulating means operating on said main memory in parallel.

4,310,880

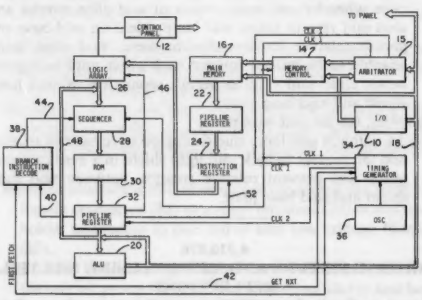
HIGH-SPEED SYNCHRONOUS COMPUTER USING PIPELINED REGISTERS AND A TWO-LEVEL FIXED PRIORITY CIRCUIT

John T. Gehman, Needham, Mass., assignor to Nixdorf Computer Corporation, Burlington, Mass.

Filed Sep. 10, 1979, Ser. No. 73,597

Int. Cl.[3] G06F *9/38*

U.S. Cl. 364—200 **11 Claims**



1. A pipelined system for generating instructions in a digital computer comprising:

means for producing first and second clock signals; CLK 1 and CLK 2, respectively;

a sequencer operating at the rate of the first clock signal to generate sequential instruction addresses;

a memory connected to receive the addresses from the sequencer and to produce instructions corresponding thereto;

a pipeline register connected to the memory to load the instructions for execution at the rate of the second clock signal;

the first and second clock signals normally being synchronous and at the same rate whereby the register loads a

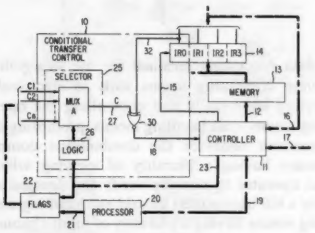
given instruction for execution while the sequencer generates the address of the sequentially following instruction; and decoder means responsive to the loading of a branch instruction into the register to cause the sequencer to generate a nonsequential address and to inhibit the second clock signal to prevent the register from loading the sequentially following instruction whereby, upon the next common occurrence of the first and second clock signals an instruction corresponding to the nonsequential address is loaded into the register and the sequencer generates the address of the instruction which follows the nonsequential address in a new sequence.

4,310,881

CONDITIONAL TRANSFER CONTROL CIRCUIT

Ismail I. Eldumiati, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 21, 1979, Ser. No. 77,613
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—200 **13 Claims**



1. A conditional transfer control circuit (**10**) for a controller (**11**) arranged for fetching instructions from a sequence of addresses (in **13**) wherein a list of instructions is stored, the conditional transfer control circuit BEING CHARACTERIZED BY

a circuit (**25**) for producing a first signal (C) representing a true or false condition resulting from executing a current instruction in the list of instructions, a circuit (**IR0**) for applying a second signal (on lead **32** indicating whether control is determined by the first signal being true or by the first signal being false, and an EXCLUSIVE NOR gate (**30**) reponsive to the first and second signals for producing a condition transfer signal (on lead **18**) that causes the controller to fetch a next subsequent instruction from an address other than the next subsequent address in the sequence of addresses wherein the list of instructions is stored.

4,310,882

DAS DEVICE COMMAND EXECUTION SEQUENCE

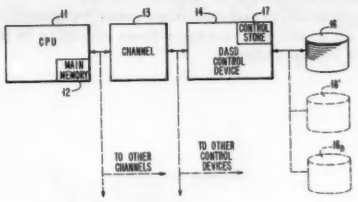
Paul W. Hunter, and Alexander E. Malaccorto, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1978, Ser. No. 973,827
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—200 **10 Claims**

1. A method for minimizing the time associated with operating a direct access storage device in disconnected mode from a channel in response to sequentially issued channel commands which are applied to a control device intercoupling the channel to the storage device,

a new command for said direct access storage device being issued after execution of the preceding command for said storage device, said control device and said direct access storage device normally presenting an ending sequence to said channel after execution of each said command, said direct access storage device operating in connected mode with said channel when receiving said commands, some of said commands involving mechanical motion of said storage device, said storage device operating in said disconnected mode when executing said commands which involve mechanical motion; comprising the steps of:

storing within said control device a first issued command involving mechanical motion of said storage device, without executing said first issued command while signalling



said channel that said first command has been executed so that said channel remain connected to said storage device; and

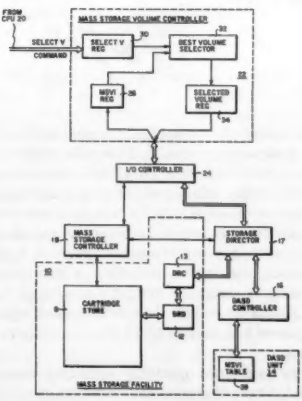
responsive to the next issued command involving mechanical motion of said storage device, executing said stored first command essentially in parallel with said next command.

4,310,883

METHOD AND APPARATUS FOR ASSIGNING DATA SETS TO VIRTUAL VOLUMES IN A MASS STORE

Robert D. Clifton, Longmont, and Richard F. Phares, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 877,435, Feb. 13, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,582
Int. Cl.[3] G06F *7/04, 13/00*
U.S. Cl. 364—200 **22 Claims**



1. Apparatus for selecting a volume space in a mass storage facility according to the attributes of a data set to be stored in the selected volume as requested by a central processing unit, said apparatus comprising:

first storage means for storing an indication of the status of each of the volumes in the mass storage facility;

second storage means for storing an indication of the requirements of the data set to be stored;

means connected to said first and second storing means for comparing each volume status indication with the require-

ments indication of the data set to identify volumes eligible for the storage of the data set;

third storage means connected to said comparing means for storing the eligible volume status indications of those volumes that meet the requirements of the data set;

means connected to said third storage means for sequencing the status indications of eligible volumes from best to worst fit according to the manner in which the volumes matched the needs of the data set to be stored; and

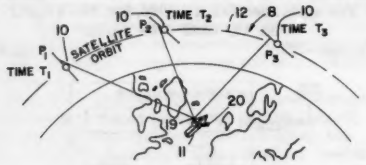
means connected to said sequencing means for transferring the data set to the mass storage volume according to the best fitting volume indicated.

4,310,884

MICROCOMPUTER-CONTROLLED PORTABLE SATELLITE SIGNAL SIMULATOR FOR EXPLORATION SYSTEMS, AND METHOD OF USE

F. Alexander Roberts, Brea; William V. Stiles; Robert C. Cosbey, both of Anaheim, and John P. Duncan, Santa Ana, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed May 9, 1979, Ser. No. 37,541
Int. Cl.[3] G06F *15/50*
U.S. Cl. 364—578 10 Claims



1. A microcomputer-controlled portable satellite signal simulator for generating a simulated Doppler-shifted signal that would have emanated from a TRANSIT navigation satellite of predetermined orbit, said signal containing appropriate modulated navigation message data for testing operational parameters of a satellite navigation receiver system in operational proximity to said simulator at a known position A, comprising:

a microcomputer system including a microprocessor for generating a series of multi-bit command words each word including pseudo-pass message and signal modulation control bits, and an I/O but connecting to a plurality of ports;

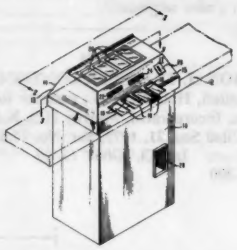
controller/transmitter circuitry including input encoding means for encoding into said microprocessor digital data related to said known position A, an interface/controller circuit having first and second I/O terminals connected between one of said plurality of ports of said I/O bus and said input encoding means, and transmitter circuitry means connected to said interface/controller circuit for controllably generating, based on said series of multi-bit words, a simulated Doppler-shifted signal to simulated operation of said pseudo-orbiting TRANSIT navigation satellite whereby said parameters associated with said satellite navigation receiver system can be accurately evaluated.

4,310,885

POINT OF SALE TERMINAL HAVING PROMPTING DISPLAY AND AUTOMATIC MONEY HANDLING

Noris S. Azcua, Huntington Beach; George D. Margolin, Newport Beach; Audrey Miller, Claremont, and Victor V. Vurpillat, Laguna Niguel, all of Calif., assignors to Auto-Register, Inc., Costa Mesa, Calif.

Filed Nov. 6, 1978, Ser. No. 957,914
Int. Cl.[3] G06F *15/21*
U.S. Cl. 364—405 41 Claims



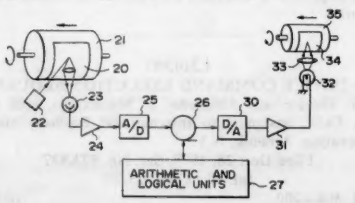
1. In a data processing terminal for use as a point of sale device having computing means with an electrical bus for interconnecting electrically and controlling the operation of bill handling means, coin handling means, prompting means for assisting operator behavior the combination comprising: a housing means having a plurality of viewing windows for enabling an operator to visually verify the denomination and genuiness of a bill transported by said bill handling means; said bill handling means having a plurality of input channels; channel indicating members associated with each input channel and under the control of said computing means for indicating which of said input channels has received a bill.

4,310,886

IMAGE GRADATION PROCESSING METHOD AND APPARATUS FOR RADIATION IMAGE RECORDING SYSTEM

Hisatoyo Kato; Masamitsu Ishida, and Seiji Matsumoto, all of Minami-ashigara, Japan, assignors to Fuji Photo Film, Co. Ltd., Kanagawa, Japan

Filed Dec. 26, 1979, Ser. No. 106,733
Claims priority, application Japan, Dec. 26, 1978, 53-163573
Int. Cl.[3] G01T *1/20*
U.S. Cl. 364—414 5 Claims



4. An apparatus for performing gradation processing of a chest radiation image in a radiation image recording system in which a stimulable phosphor is scanned with a stimulating ray and the chest radiation image information recorded therein is read out and converted into an electric signal upon stimulation thereof and then a visible image is recorded on a recording medium by use of a scanning recording beam modulated by the electric signal, said gradation processing apparatus comprising means for determining a signal level corresponding to the boundary between the heart and the lungs of the chest radia-

tion image, means for detecting the substantial maximum and minimum values of said electric signal, and gradation processing means for processing the gradation of the image by lowering the level of the electric signal generally in the range of the level corresponding to the density range between the substantial maximum and minimum densities of the image with the level of the electric signal corresponding to the density at the boundary between the lungs and the heart lowered to the most extent in said range.

4,310,887

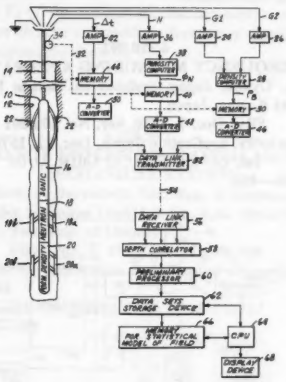
VERIFICATION AND CALIBRATION OF WELL LOGS AND RECONSTRUCTION OF LOGS

Jean A. Suau, London, England, assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 284,135, Aug. 28, 1972. This application May 30, 1979, Ser. No. 43,689

Int. Cl.[3] G06F *15/20*

U.S. Cl. 364—422 **14 Claims**



1. A method of machine processing the outputs of borehole investigating devices passed through borehole sections to take respective measurements of the surrounding earth formation comprising:

deriving at least three logs of the borehole sections from the outputs of said investigating devices, said logs being different from each other but being functionally related to the same earth formation characteristic, each log comprising a respective borehole measurement of the earth formation at each of a succession of borehole depths, and forming from said logs, for each given one of said succession of borehole depths, a respective set of borehole measurements, each set comprising a borehole measurement from each of said logs;

providing a number of different combinations of values, each combination comprising values equal in number to the number of said logs;

producing an occurrence representation related to said first selected borehole section by finding, for each of said combinations of values, the occurrence of similarly valued sets among the sets of said borehole measurements which are from the logs taken at a first selected borehole section;

combining the sets of said sets of borehole measurements which are from the logs taken at a second selected borehole section with said occurrence representation related to the first selected borehole section to produce a calibration correction indicative of a desired correction for the portion of one of the logs taken at said second selected borehole section, and utilizing said calibration correction to convert the last selected log portion into an improved, calibrated log portion consistent with said occurrence representation.

4,310,888

TECHNIQUE FOR CONTROLLING THE STARTING OPERATION OF AN ELECTRONIC ENGINE CONTROL APPARATUS

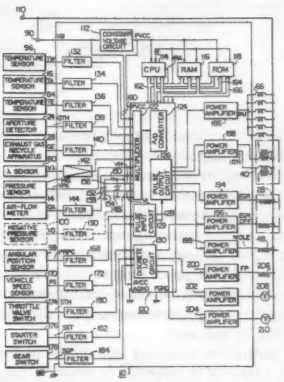
Toshio Furuhashi; Hiroastu Tokuda; Seiji Suda, and Masumi Imai, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 13, 1979, Ser. No. 11,845

Claims priority, application Japan, Feb. 13, 1978, 53-14101

Int. Cl.[3] G05B *15/02*; G06F *15/20*; F02P *5/04*

U.S. Cl. 364—431.10 **24 Claims**



1. A method of operating a processor-controlled apparatus for controlling the operation of a combustion engine, said engine including an output shaft driven by mechanical energy converted from heat energy caused by the combustion of a fuel, at least one means controlling energy conversion in response to control signals applied thereto, and engine starting means which includes switching means having first and second states and wherein, during the second state of said switching means, said engine is started by a starter motor, said apparatus being coupled to receive signals produced by sensor means indicative of operating conditions of the engine and including input/output means adapted to receive sensed signals from said sensor means and to deliver control signals to said energy conversion controlling means, said input/output means including first means for generating said control signals in accordance with processor-generated engine control data and second means for producing a starter signal representative of the state of the switching means;

said method comprising the steps of:

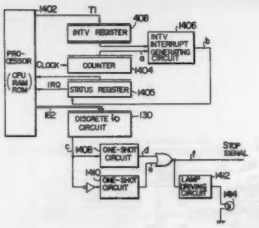
(a) detecting a change to the first state from the second state of said switching means in accordance with the starter signal produced by the second means of the input/output means; and

(b) starting, in accordance with step (a), an operation for detecting the condition of the stopping of energy conversion, so as to return said first means of said input/output means to a prescribed initial condition in response to the termination of energy conversion by said engine.

4,310,889
APPARATUS FOR ELECTRONICALLY CONTROLLING INTERNAL COMBUSTION ENGINE

Masumi Imai; Masao Takato, both of Hitachi, and Hiroastu Tokuda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 18, 1978, Ser. No. 952,326
Claims priority, application Japan, Oct. 19, 1977, 52-125968
Int. Cl.³ F02P *5/08, 11/06*
U.S. Cl. 364—431.04 **37 Claims**



8. An electronic engine control apparatus adapted for use with a combustion engine comprising

digital processing means having a central processing unit, a random access memory and a read-only memory, utilized for controlling operational conditions of said engine;

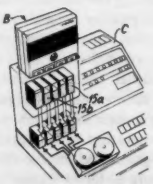
interrupting signal generating means for generating an interrupting signal having a predetermined period to be applied to said digital processing means in response to delivery of data representative of an interval period corresponding to said predetermined period from said digital processing means; and

detecting means for detecting said digital processing means to be in a state of its normal operation in response to said digital processing means producing output data corresponding to a pulse train having a pulse duration substantially equal to said predetermined period of said detecting means.

4,310,890
PARKING SYSTEM

Karl B. Trehn, Lillgarden, Överby, 150 12 Stjärnhov, and Nils H. Swahn, Granevägen 8, 182 65 Djursholm, both of Sweden

Filed May 22, 1979, Ser. No. 41,531
Claims priority, application Sweden, May 25, 1978, 7805975
Int. Cl.³ G07C *1/30*
U.S. Cl. 364—467 **8 Claims**



1. A parking system for vehicles comprising:

sign means for displaying coded information relating to at least one of the conditions of parking time, cost, payment and permission to park a vehicle in a parking space associated with the sign;

parking meter means having

data entry means for entering at least some of the information displayed on said sign means,

cipher indicator means for displaying the information entered on said data entry means,

main memory means for receiving and storing a predetermined number of information segments,

accounting memory means connected to selectively receive at least some of the information segments from said main memory means for storing the information segments so received,

controller means for selectively transferring at least some of the information segments from said main memory means to said accounting memory means during the time period in which the vehicle is parked in the parking space in accordance with said displayed information,

means for determining that said meter means is operating in accordance with the information displayed on said cipher indicator, and

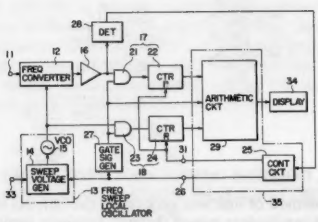
debit indicator means for indicating that said parking meter means is operating in accordance with the information displayed on said cipher indicator; and

terminal means having means for connecting said parking meter means thereto for receiving and processing stored parking information.

4,310,891
FREQUENCY MEASURING APPARATUS

Shoji Niki, Gyoda, Japan, assignor to Takeda Riken Kogyo Kabushiki Kaisha, Japan

Filed Dec. 7, 1979, Ser. No. 101,081
Claims priority, application Japan, Dec. 12, 1978, 53/152694
Int. Cl.³ G06F *15/20;* **G01R** *23/00*
U.S. Cl. 364—484 **17 Claims**



1. A frequency measuring apparatus comprising:

means for providing an input signal;

a frequency sweep local oscillator having an output;

a frequency converter, operatively connected to said frequency sweep local oscillator, supplied with the output from said frequency sweep local oscillator and the input signal for producing, as an output, intermediate-frequency signals having frequencies corresponding to the differences between the input signal frequency and the frequency of the output of said frequency sweep local oscillator and between the input signal and the harmonic frequencies of the output of said frequency sweep local oscillator;

an amplifier, operatively connected to said frequency converter, for amplifying the output from said frequency converter;

intermediate frequency measuring means, operatively connected to said amplifier, for measuring the frequency of the output of said amplifier;

local oscillation frequency measuring means, operatively connected to said frequency sweep local oscillator, for measuring the frequency of the output of said frequency sweep local oscillator;

control means, operatively connected to said intermediate frequency measuring means and said local oscillation frequency measuring means, for controlling the intermediate-frequency measuring means and the local oscillation frequency measuring means to simultaneously measure the frequencies of the outputs of said amplifier and said fre-

quency sweep local oscillator at least twice during a predetermined interval of time; and

an arithmetic circuit, operatively connected to said intermediate frequency measuring means and said local oscillation frequency measuring means, for calculating the following equation:

$$N = \text{Integer}\left(\frac{F_{I1} \sim F_{I2}}{F_{I1} \sim F_{I2}} + \alpha\right)$$

where F_{I1} and F_{I2} are the frequencies measured at least twice by said intermediate frequency measuring means, where F_{I1} and F_{I2} are the frequencies measured at least twice by said local oscillation frequency measuring means, and where α is zero or a decimal, [N=Integer $(F_{I1} \sim F_{I2}/F_{I1} \sim F_{I2} + \alpha)\alpha$: zero or a decimal]

said arithmetic circuit also for determining which of F_{I1} and F_{I2} is larger, and for calculating the frequency of the input signal in accordance with the determination, the frequency F_I of the output of said frequency sweep local oscillator and the intermediate-frequency signal frequency F_i corresponding thereto.

4,310,892

METHOD FOR DETERMINING IMBALANCE IN A MECHANICAL SYSTEM

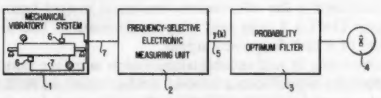
Guenther Himmler, Darmstadt, Fed. Rep. of Germany, assignor to Gebrueder Hofmann GmbH & Co. K.G. Maschinenfabrik, Darmstadt, Fed. Rep. of Germany

Filed Jun. 7, 1979, Ser. No. 46,164

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1978, 2827669

Int. Cl.³ G01M *1/22*; G06F *15/347*

U.S. Cl. 364—508 **5 Claims**



1. In a mechanical vibratory system having pickups which are connected via a measuring unit to a probability optimum filter, a method for determining the magnitude and phase position of oscillations caused by imbalance in the mechanical vibratory system, said method comprising the steps of:

detecting oscillations by means of said pickups affixed to said system,

converting said oscillations by means of said measuring unit to a measured signal containing errors due to disturbances in the measuring system,

filtering said measured signal by means of said measuring unit so as to derive a selected signal having a known amplitude and frequency,

deriving, from said measured signal, disturbance variables corresponding to said disturbances in the measuring system,

providing covariance matrices of said disturbance variables to said probability optimum filter,

converting said selected signal, in said probability optimum filter, into a probability optimum estimate rate of the state of said vibratory system,

computing a corrected and restored selected signal having the effects of said errors due to disturbances in the measuring system minimized, and

displaying the corrected and restored selected signal.

4,310,893

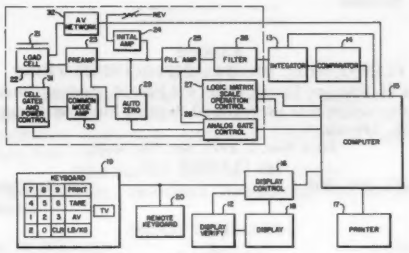
DIGITAL SCALE

Richard C. Loshbough, Westerville, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio

Filed Dec. 12, 1979, Ser. No. 103,093

Int. Cl.³ G01G *19/413, 23/365*; G06F *15/20*

U.S. Cl. 364—567 **19 Claims**



19. In a digital scale, in combination, apparatus for generating a verification signal representing a verification weight, storage means for storing a reference verification value, microprocessor means including means for storing a span multiplying factor, the microprocessor means including means for multiplying the verification weight represented by the verification weight signal by the span multiplying factor, the microprocessor means also including means to change the stored span factor when the difference between the stored reference value and the verification weight is within predetermined limits to reduce the difference toward zero.

4,310,894

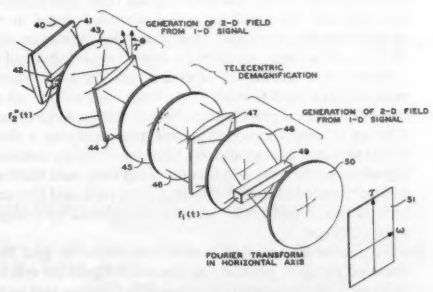
HIGH SPEED AMBIGUITY FUNCTION EVALUATION BY OPTICAL PROCESSING

Tzuo-Chang Lee, and Poohsan N. Tamura, both of Bloomington, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 20, 1979, Ser. No. 105,809

Int. Cl.³ G06G *9/00*

U.S. Cl. 364—822 **10 Claims**


GENERATION OF 2-D FIELD FROM 1-D SIGNAL
TELECENTRIC DEMAGNIFICATION
GENERATION OF 2-D FIELD FROM 1-D SIGNAL
FOURIER TRANSFORM IN HORIZONTAL AXIS

6. Apparatus for evaluation of the ambiguity integral using a collimated beam of light, propagating along an optical axis comprising:

a first data input module for generating an image comprising: a cylindrical lens to focus the light into a line in a focal plane, a one-dimensional spatial light modulator lying in said focal plane along said line, a spherical lens and a cylindrical lens for recollimating the light beam;

a second data input module for modifying said image comprising: a cylindrical lens and a spherical lens which, acting together, focus the light beam into a line in a focal

plane, a one-dimensional spatial light modulator lying in said focal plane along said line;

a Fourier transform and imaging module comprising a spherical lens;

and a detection module in the ambiguity plane;

said modules defining an optical axis;

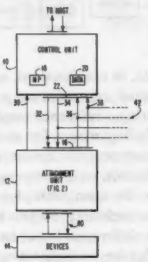
the image generated by the first data input module being rotated about said optical axis with respect to the other modules.

4,310,895

PLURAL NULL DIGITAL INTERCONNECTIONS

Gene H. Edstrom, Cortez, Colo., and Paul H. Paulsen, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 2, 1979, Ser. No. 90,805
Int. Cl.[3] G06F *3/00*
U.S. Cl. 364—900 31 Claims



18. In attachment circuit means for connecting a controlled unit to a controlling unit,

the improvement comprising:

a first set of tag lines for carrying binary encoded signals from said controlling unit to said controlled unit;

a second set of tag lines for carrying binary encoded signals from said controlled unit to said controlling unit;

other electrical signal means operatively interconnecting said units;

decoding means connected to said first set of tag lines for receiving said binary encoded signals from said controlling unit and for supplying a first decoded signal in response to a first set of said binary encoded signals on said first set of tag lines, supplying a second decoded signal in response to a second set of said binary encoded signals received over said first set of tag lines, said second set of binary encoded signals being a binary complement of said first set of binary encoded signals and supplying a third decoded signal in response to a third set of binary encoded signals received over said first set of tag lines, said third set of binary encoded signals differing from each said first and second sets of said binary encoded signals but by a single signal change;

control means having first means responsive to said first decoded signal to generate an electrical signal for electrically indicating a logical disconnection between said units, second means responsive to said second decoded signal to generate an electrical signal for electrically indicating a logical connection between said units without any interactive operations, and third means responsive to said third decoded signal to generate an electrical signal for electrically indicating an interactive operation between said units via said other electrical signal means said first, second and third means being electrically interconnected when said third decoded signal immediately follows said second decoded signal and being further responsive to said third decoded signal immediately following said first decoded signal to generate an electrical signal for electrically indicating a change from said logical disconnection to said logical connection of said units; and

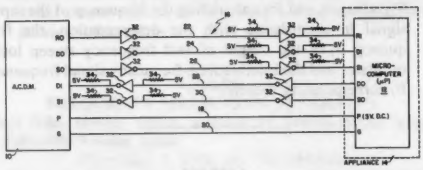
checking means connected to said control means and responsive to said generated electrical signals which electrically indicate detection of predetermined sequences of said generated electrical signals which electrically indicate predetermined functions with respect to said units.

4,310,896

METHOD OF INTERFACING REMOTE UNITS TO A CENTRAL MICROPROCESSOR

Scott E. Cutler; Charles W. Eichelberger, both of Schenectady, N.Y., and Michael A. Haase, Euclid, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 13, 1979, Ser. No. 93,683
Int. Cl.[3] G06F *3/04*
U.S. Cl. 364—900 13 Claims



1. A method for transmitting N bits of binary information between a first electronic unit over a first transmission interface, a telecommunications line, and a second transmission interface, to a second electronic unit, in accordance with a handshaking routine, N being a positive integer, and said first and second transmission interfaces each comprising a respective set of four lines, said handshaking routine comprising the steps of:

(a) simultaneously transmitting a first strobe signal STROBE 1 and a first data signal DATA 1, respectively, on first and second ones of said four lines of said first transmission interface;

(b) transmitting the information contained in said first data signal DATA 1 over said telecommunications line in the form of a first frequency signal;

(c) converting in said second transmission interface said first frequency signal into a second strobe signal STROBE 2 and a second data signal DATA 2, said second data signal DATA 2 containing the same information as said first data signal DATA 1;

(d) simultaneously transmitting said second strobe and data signals STROBE 2 and DATA 2, respectively, over first and second ones of said four lines of said second transmission interface to said second electronic unit;

(e) simultaneously transmitting from said second electronic unit a third strobe signal STROBE 3 and a third data signal DATA 3 on third and fourth ones of said four lines of said second transmission interface, respectively, information differing from the information contained in said DATA 2 signal;

(f) transmitting the information contained in said DATA 3 signal over said telecommunications line in the form of a second frequency signal;

(g) converting in said first transmission interface said second frequency signal into a fourth strobe signal STROBE 4 and a fourth data signal DATA 4, said fourth data signal DATA 4 containing the same information as said third data signal DATA 3;

(h) simultaneously transmitting said fourth strobe and data signals to said first remote electronic unit, respectively, over third and fourth lines of said first transmission interface to said first electronic unit;

(i) terminating transmission of said first strobe and data signals when said first electronic unit receives said fourth strobe and data signals; and

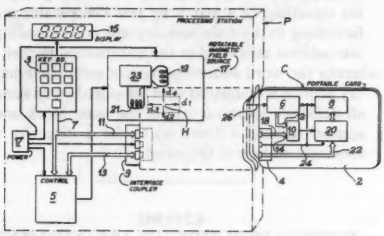
(j) terminating transmission of said strobe and data signals generated by said second electronic unit when said second electronic unit receives the termination of said first strobe and data signals.

4,310,897

PORTABLE CARD INCORPORATING MAGNETIC BUBBLE ELEMENTS

Jean-Pierre Lazzari, Montfort l'Amaury, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme), Paris, France

Filed Nov. 1, 1979, Ser. No. 90,248
Claims priority, application France, Dec. 21, 1978, 78 36048
Int. Cl.³ G11C 7/00, 19/08
U.S. Cl. 365—1 11 Claims



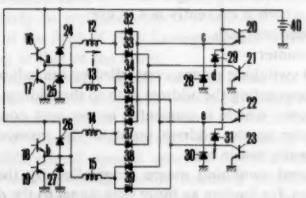
1. A portable card adapted to be used in a data processing system having a data processing station and means disposed at said processing station for establishing a rotating magnetic field at said processing station, said card comprising means for processing data, at least part of said means including magnetic bubble elements for interfacing with the processing station and the established rotating magnetic field generated at said processing station external of said card and coupler means separate from said processing means for interfacing with said processing station to enable the flow of data between said card and said processing station.

4,310,898

MINIMUM MAGNETIC BUBBLE DRIVING CIRCUITS FOR MULTIPLE COILS

Kazutoshi Yoshida, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 8, 1979, Ser. No. 1,456
Claims priority, application Japan, Mar. 24, 1978, 53/33065
Int. Cl.³ G11C 19/08
U.S. Cl. 365—6 6 Claims



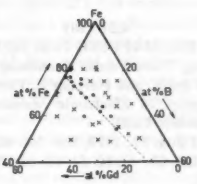
1. In a magnetic bubble driving circuit adapted to drive (N×M) coil circuits of the type wherein the driving circuit for supplying current to a plurality of coils which generate rotating magnetic field is divided into a switch side circuit and a driver side circuit for passing current through a predetermined one of the coils, the improvement wherein said driving circuit comprises (N+M) component circuits, where N represents the number of the component circuits of the switch side circuit and M the number of the component circuits of the driver side circuit wherein $N+M \geqq 3$, said coil circuits connected in parallel between N switch side component circuits and M driver side component circuits through opposed steering diode circuit means for selecting a unique path for each polarity of current flow through each coil circuit.

4,310,899

THERMOMAGNETIC RECORD CARRIER

Johannes W. M. Biesterbos, and Albertus G. Dirks, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 10, 1980, Ser. No. 111,139
Claims priority, application Netherlands, Jun. 2, 1979, 7900921
Int. Cl.³ G11C 13/06
U.S. Cl. 365—113 3 Claims



1. A record carrier, suitable for the thermomagnetic writing of information thereon and the magneto-optical reading of information therefrom, comprising a substantially planar, non-magnetizable substrate and an amorphous layer of a rare-earth metal/iron alloy on said substrate, said alloy having an easy axis of magnetization perpendicular to the plane of the layer, characterized in that the rare-earth metal/iron alloy also contains boron, said alloy having a composition defined by the formula

$$[RE_xFe_{1-x}]_{1-y}B_y$$

where RE is at least one rare-earth metal, and $0.2 \leqq x \leqq 0.3$, and $0.15 \leqq v \leqq 0.3$.

4,310,900

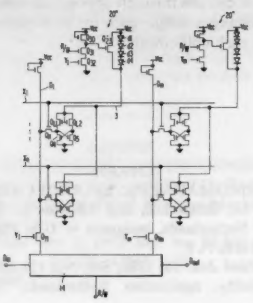
MEMORY DEVICE WITH DIFFERENT READ AND WRITE POWER LEVELS

Tohru Tsujide, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1979, Ser. No. 92,304
Claims priority, application Japan, Nov. 8, 1978, 53-137487
Int. Cl.³ G11C 7/00, 11/40
U.S. Cl. 365—190 15 Claims

1. A memory device comprising a plurality of word lines, a plurality of digit lines, and a plurality of memory means, each of said memory means including a word terminal connected to an associated one of said word lines, a data terminal connected to an associated one of said digit lines, and a power voltage terminal for receiving a power voltage for said memory means, means for supplying said power supply terminals of said memory means with a first voltage when a read operation is formed, and means for supplying said power supply terminal of at least

a selected one of said memory means with a second voltage when a write operation is performed, said second voltage being



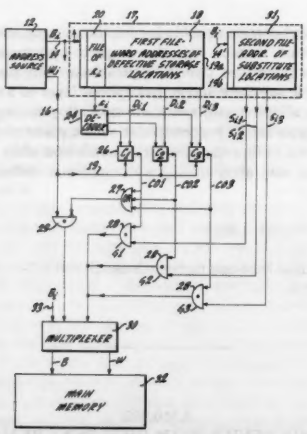
smaller than said first voltage in absolute value and being capable of maintaining the information of the memery cell.

4,310,901

ADDRESS MAPPING FOR MEMORY

Phillip A. Harding, Palos Verdes Pennisula; Carlos F. Chong, Rancho Palos Verdes, and Herman L. Pockell, Torrance, all of Calif., assignors to Electronic Memories & Magnetics Corporation, Encino, Calif.

Filed Jun. 11, 1979, Ser. No. 47,279
Int. Cl.[3] G11C *11/40, 13/00*
U.S. Cl. 365—200 22 Claims



1. In an addressable main memory organized in blocks containing words, each main memory word being addressable by a corresponding main memory address having a block address portion and word address portion, apparatus for supplying substitute addresses to be used in place of addresses of defective main memory words, said apparatus comprising:

auxiliary memory means for storing a plurality of information packets respectively corresponding to blocks of the main memory, said auxiliary memory means being operable for having each packet selectively readable therefrom in response to application thereto of the respectively corresponding main memory block address alone, said auxiliary memory being so operable without any application thereto of the corresponding main memory word address, each information packet containing the word addresses of the words within the corresponding main memory block containing defects and also containing respectively associated substitute addresses;

comparator means coupled to said auxiliary memory means for receiving the defective word addresses of an information packet read therefrom, and signalling any match between the applied main memory word address and the same defective word address contained in said information packet

means for applying a desired main memory address having a block address portion and a word address portion with the block address thereof being applied to said auxiliary memory means and the word address being applied to the said comparator means;

gating means coupled to said auxiliary memory means for receiving substitute addresses read therefrom and to said comparator means, said gating means being responsive to the signalling of a match by said comparator means for furnishing to the main memory, the corresponding substitute address contained in the information packet;

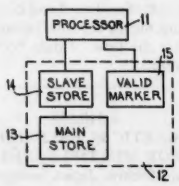
whereby the word address portion of an applied main memory address is compared with the stored word addresses of all defective locations within the same block and, if the applied address is found to be for a defective word, a substitute address is furnished.

4,310,902

INFORMATION STORAGE ARRANGEMENTS

Philip Broughton, Bolton, England, assignor to International Computers Limited, London, England

Filed Apr. 21, 1980, Ser. No. 141,790
Claims priority, application United Kingdom, May 9, 1979, 16020/79
Int. Cl.[3] G11C *11/40*
U.S. Cl. 365—218 5 Claims



1. An information storage arrangement comprising

(a) at least two random access memories each having its own address input and its own data input and output;

(b) means for indicating which memory is currently in use and which is currently not in use;

(c) an address path

(d) a counter

(e) first switching means, controlled by the indicating means, for connecting the address path to the address input of the memory which is currently in use and connecting the counter to the address input of the memory which is currently not in use;

(f) second switching means, controlled by the indicating means, for feeding an input data signal to the data input of the memory which is currently in use and for feeding a predetermined value to the data input of the memory which is currently not in use;

(g) third switching means, controlled by the indicating means, for reading an output data signal from the data output of the memory which is currently in use; and

(h) means responsive to a "reset" command for switching the indicating means so that the memory currently not in use becomes the memory currently in use and vice versa.

4,310,903

METHOD OF AND APPARATUS FOR PROVIDING INFORMATION AS TO THE EXISTENCE OR POSITION OF OBJECTS

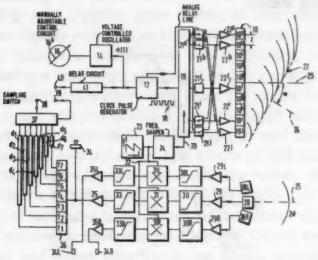
Leslie Kay, 82 Scarborough Rd., Christchurch 8,, New Zealand

Filed Aug. 21, 1979, Ser. No. 68,432

Claims priority, application New Zealand, Aug. 21, 1978, 188192

Int. Cl.[3] G01S *15/34*

U.S. Cl. 367—102 12 Claims



1. In a method of providing information as to the existence or position of objects otherwise than by direct vision comprising the steps of, radiating stress wave energy (herein called the transmitted signal) from a station to a field of view, receiving at the station at least part of the transmitted signal (such part herein being called the received signal) reflected from the object, carrying out a frequency modulation of the transmitted signal to produce a frequency difference between the received signal and a correspondingly frequency modulated locally generated signal in a mode such that the magnitude of the frequency difference represents the range of the object from the station, operating upon the received signal with the locally generated signal to produce an indicator signal of said difference frequency providing for range indication, and determining or sensing the angular position of the object with respect to a reference axis extending through the station and the field of view by observation of a characteristic of the indicator signal which is dependent upon the angular position of the object, the improvement comprising:

(a) radiating the stress wave energy into the field of view in the form of a beam,

(b) moving the beam angularly from a datum position occupied at a datum time to effect scanning of the field of view successively to irradiate objects contained in successive sectors of the field of view having angular widths corresponding to that of the beam,

(c) displaying indicator signals derived from the received signals due to these objects in a mode providing an indication of the sector of the field of view in which the beam is located to irradiate each object, by providing sensually perceptible stimuli spaced apart in one dimension in a manner corresponding to the scanning position of the beam, and spaced apart in another dimension in a manner corresponding to the range of the object,

and wherein:

(i) indicator signals of differing frequencies derived from received signals due to objects of different ranges are subjected, before producing the stimuli, to different delays to bring them into coincident time relation at different respective receiving outlets,

(ii) these outlets are subjected to sequential sampling to generate the respective spaced stimuli.

4,310,904

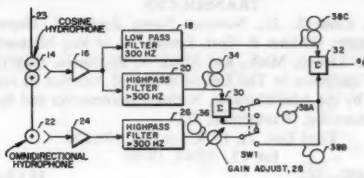
AMBIENT SEA NOISE ELIMINATION METHOD AND APPARATUS

Samuel S. Ballard, Hollis, and Ronald P. White, Amherst, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 30, 1974, Ser. No. 510,817

Int. Cl.[3] H04B *11/00*

U.S. Cl. 367—131 19 Claims



1. A method for minimizing ambient subsurface noise from acoustic signals propagating beneath the surface of the sea comprising the steps of

detecting acoustic signals at a first location with a directional hydrophone having a null in a horizontal plane and providing a first signal corresponding to acoustic signals detected by said directional hydrophone;

detecting acoustic signals at a second location vertically spaced from said first location with an omnidirectional hydrophone and providing a second signal corresponding to acoustic signals detected by said omnidirectional hydrophone; and

summing said first and second signals thereby to produce a signal in which vertically travelling subsurface noise is minimized.

4,310,905

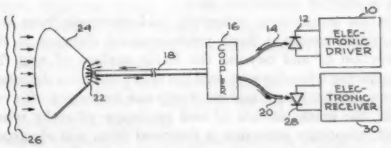
ACOUSTICAL MODULATOR FOR FIBER OPTIC TRANSMISSION

John P. Palmer, Pomona, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Feb. 20, 1980, Ser. No. 123,040

Int. Cl.[3] H04R *23/00*

U.S. Cl. 367—140 10 Claims



1. A fiber optic acoustical modulator comprising:

launch coupler means having an input port, a bidirectional port and an output port, the bidirectional and output ports being interconnected by a first single optical fiber, said input port communicating with said bidirectional port through a second single optical fiber connected to and terminating at said first fiber at a location between the bidirectional and output ports;

signal generating means adapted to provide an optical signal to said input port;

an acoustically sensitive membrane having an optically reflective surface;

a bidirectional single optical fiber having two ends, one end being optically connected to said bidirectional port and the other end positioned adjacent said reflective surface; and

signal receiving means adapted to receive optical signals from and operatively connected to said output port,

whereby signals from said generating means are provided to

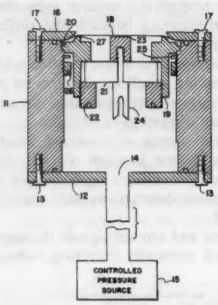
said input port; unidirectionally coupled to said first fiber by said second fiber; exit said coupler in the bidirectional fiber; are transmitted to, modulated and reflected by said reflective surface; returned to said bidirectional fiber; and transmitted from said bidirectional fiber to said receiving means through said first fiber in said coupler means.

4,310,906

LIQUID-IMMERSIBLE ELECTROSTATIC ULTRASONIC TRANSDUCER

John H. Cantrell, Jr., Newport News; Joseph S. Heyman, Gloucester; William T. Yost, Emory, all of Va.; Michael A. Torbett, Lirona, Mich., and Mack A. Breazeale, Knoxville, Tenn., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 21, 1979, Ser. No. 106,136
Int. Cl.³ H04R *19/00*
U.S. Cl. 367—181 **14 Claims**



1. A broadband electrostatic acoustic transducer having a megahertz range frequency response comprising:

a flat thin conductor;

an enclosure including said flat thin conductor which forms a part of the outside surface of said enclosure;

an electrode having a flat end;

means for mounting said electrode inside said enclosure such that said flat end of said electrode is approximately parallel to said flat conductor; and

means for temporarily extending said electrode from said mounting means a fixed predetermined distance in the direction of and beyond the inside surface of said flat conductor whereby with said flat thin conductor detached from said enclosure said electrode can be lapped off even with the inside surface of said enclosure whereby when said temporary extension is removed from said electrode and said flat thin conductor is replaced the flat thin conductor and the electrode form a capacitor with capacitor plates said predetermined distance apart and precisely parallel to each other.

4,310,907

SCAN CONVERTER FOR A SECTOR SCAN TYPE ULTRASOUND IMAGING SYSTEM

Ryobun Tachita; Yoshihiro Hayakawa; Hiroshi Fukukita; Tsutomu Yano; Kazuyoshi Irioka, and Akira Fukumoto, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

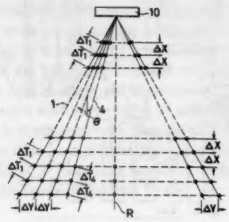
Filed Dec. 4, 1979, Ser. No. 100,707
Claims priority, application Japan, Dec. 8, 1978, 53-152389
Int. Cl.³ G01S *15/89*
U.S. Cl. 367—11 **12 Claims**

1. A scan converter for converting successively received echo signals representative of the amplitude of ultrasound energy returning along a plurality of angularly spaced paths distributed in a sector field with a substantially equal tangential angular increment with respect to a reference line into a signal for a plurality of successive raster scan lines, comprising:

a digital storage device having storage cells arranged in a matrix array of rows and columns;

means for sampling said received echo signals at a speed inversely proportional to the cosine of the angle of said path with respect to said reference line so that the sampled points of said echo signals are located along lateral lines which are perpendicular to said reference line;

means for converting said received echo signals into digital echo amplitude representative data in response to said sampling means;



means for writing said digital echo data in said storage device in the direction of said columns;

means for retrieving the digital echo data from said storage device in the direction of said rows;

an interpolator for generating additional digital echo data representative of interpolations between succesively retrieved data from said storage device and writing said interpolation representative data and said retrieved data in a buffer storage device; and

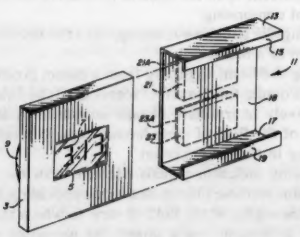
means for retrieving data from preselected storage locations of said buffer storage device at a constant rate.

4,310,908

ADHESIVELY ATTACHABLE TIMEPIECE

Thomas J. Fuerneisen, Carefree, Ariz., assignor to Microtime Incorporated, Scottsdale, Ariz.

Filed Apr. 25, 1980, Ser. No. 143,824
Int. Cl.³ G04C *23/02*; G04B *37/00*
U.S. Cl. 368—88 **6 Claims**



1. An electronic timepiece comprising in combination;

(a) a solid state electronic timepiece component having a digital display element;

(b) enclosure means for partially enclosing said solid state electronic timepiece component, said enclosure means having a back wall and a side wall attached to said back wall, said solid state electronic timepiece being rigidly attached to an inner surface of said back wall, said side wall surrounding said solid state electronic timepiece component;

(c) support plate means for supporting said enclosure means

with said solid state electronic timepiece component attached thereto, said support plate means having substantially parallel front and rear major surfaces, said support plate means having a viewing aperture therein for exposing said digital display element to allow viewing of said digital display element, said support plate means having substantially parallel upper and lower edges, said support plate means having enclosure receiving means for removably receiving said enclosure means and rigidly supporting said enclosure means so that said digital display element is properly aligned with said viewing aperture;

(d) mounting clip means for receiving and removably supporting said support plate means as said support plate means rigidly supports said enclosure means and said solid state timepiece component, said mounting clip means including a back plate and upper and lower edge engaging means attached to said back plate for slideably engaging said upper and lower edges of said support plate means to effect rigid, removable engagement of said support plate means with said mounting clip means as said support plate means rigidly supports said enclosure means; and

(e) adhesive means attached to a rear surface of said back plate of said mounting clip means for adhesively attaching said electronic timepiece to a smooth object surface, said upper and lower edge receiving means maintaining said solid state electronic timepiece component in fixed relationship with said smooth object surface.

4,310,909

ANALOG ELECTRONIC TIMEPIECE

Masanori Fujita, Tokyo, Japan, assignor to Kabushiki Kaisha Seikosha, Tokyo, Japan

Filed May 22, 1980, Ser. No. 152,477

Claims priority, application Japan, May 28, 1979, 54-71572[U]

Int. Cl.³ G04C *17/02*

U.S. Cl. 368—240 **7 Claims**

1. An analog electronic timepiece comprising:

a plurality of first display segments which are radially arrayed;

a plurality of second display segments each of which is arrayed on an extension line of a corresponding one of said first display segments;

a drive circuit for driving said display segments which selectively turns on any one of the first display segments to indicate a short pointer display and selectively turns on any one of the first display segments and the second display segment on the extension line thereof to indicate a long pointer display; and

a control circuit coupled to said drive circuit which, when one first display segment indicating the short pointer and one first display segment indicating a part of the long pointer display coincide, causes at least one of the first display segments adjacent to the first display segment which displays the long pointer display to display the short pointer display.

4,310,910

OPTIMAL POLARIZATION FOR THE OPTICAL READOUT OF HIGH DENSITY VIDEO RECORDING

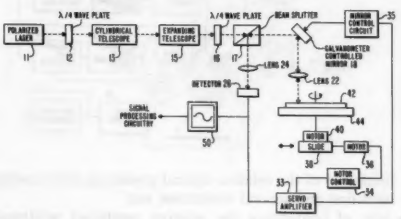
Ping Sheng, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 25, 1979, Ser. No. 33,265

Claims priority, application United Kingdom, Sep. 19, 1978, 37355178

Int. Cl.³ G11B *7/00*; H04N *5/84*

U.S. Cl. 369—116 **2 Claims**



1. In an optical playback system for recovering from a disc record data recorded along an elongated information track as a succession of depressed areas having various lengths, alternating along the track elongation with relatively non-depressed areas, the apparatus comprising:

a light source which emits a linearly-polarized coherent light beam having a wavelength which is comparable to the shortest of said various lengths

means for focusing said light beam to a spot on said information track and orienting the longitudinal axis of said light beam such that said longitudinal axis is substantially perpendicular to a surface of said disc record;

a first quarter-wave plate, interposed between said light source and said information track, having an optical axis oriented for providing a circularly-polarized light beam in response to said linearly-polarized light beam;

a second quarter-wave plate, interposed between said first quarter-wave plate and said information track, for providing a second linearly-polarized light beam in response to said circularly-polarized light beam;

means for establishing relative motion between said information track and said focused light spot;

light detection means, responsive to light diffracted by said information track during the occurrence of said relative motion, for developing electrical signals representative of said recorded data;

means for rotating said second quarter-wave plate such that the polarization of said light spot is rotated around said longitudinal axis; and

means, responsive to said light-detection means, for indicating the signal strength of said light detection means.

4,310,911

CONTROL INFORMATION DETECTING METHOD AND APPARATUS IN OPTICAL-TYPE VIDEO DISC PLAYER

Tooru Fujishima, Yokohama, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 30, 1979, Ser. No. 7,809

Claims priority, application Japan, Jan. 30, 1978, 53-8249

Int. Cl.³ H04N *5/76*; G11B *7/00*

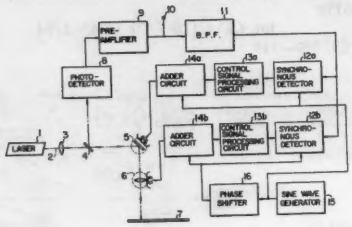
U.S. Cl. 369—45 **12 Claims**

1. A method of controlling the relative positional relationship between an object to be controlled and a single photodetector having an original optical axis therebetween by means of the response to small wobbles applied in two independent directions, comprising:

a step of applying small wobbles to the relative positional relationships between said object and said single photodetector in a first direction transverse to the original optical

axis therebetween and a second direction of the original optical axis, respectively, by two signals phase-shifted from each other and having the same frequency;

a step of processing an output of said single photodetector responsive to said small wobbles by means of said two signals to separately detect respective informations representative of the relative optical positional relationships in said first and second directions; and



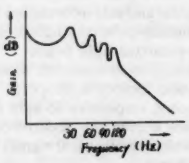
a step of controlling the relative positional relationships between said object and said photodetector in said first and second directions in accordance with the separately detected informations, respectively.

4,310,912

SERVO SYSTEM FOR RECORDING AND/OR REPRODUCING APPARATUS USING A ROTATABLE RECORDING CARRIER

Masahiro Kikuchi, Tokyo; Hitoshi Okada, Chiba; Takao Ihashi, Urawa, and Takeo Kaji, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 29, 1977, Ser. No. 782,438
Claims priority, application Japan, Apr. 2, 1976, 51-37476
Int. Cl.³ H04N *5/76;* **G11B** *21/10*
U.S. Cl. 369—43 **5 Claims**



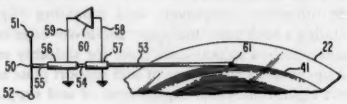
1. In apparatus having means for rotating a record carrier adapted to have signals recorded thereon in a predetermined track, and transducer means for recording and/or reproducing signals in said track when in a predetermined condition in respect to the latter and including an element which is movable for establishing said condition; servo means comprising detector means for detecting deviations from said predetermined condition of said transducer means in respect to said carrier due to fluctuations of said carrier occurring upon the rotation thereof, and producing corresponding servo control signals, drive means responsive to said servo control signals for displacing said movable element in the sense to eliminate said deviations from said predetermined condition, and a servo control circuit applying said servo control signals to said drive means, said drive means and servo control circuit having respective gain-frequency characteristics which combine to provide said servo means with a resultant gain-frequency characteristic having peaks at a fundamental frequency corresponding to the rotational speed of said carrier and at least at one harmonic of said fundamental frequency, said peaks in said resultant gain-frequency characteristic being relative to the response of said servo means at frequencies adjacent said peaks, and said resultant gain-frequency characteristic falling off with increasing frequencies to provide said servo means with a gain less than one at a frequency which is sufficiently high to cause the response of said servo means to said deviations to be delayed 180° from the latter.

4,310,913

STYLUS TRACKING AID USING TWO BIMORPH ELEMENTS LONGITUDINALLY ALIGNED

Michael E. Miller, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 26, 1979, Ser. No. 61,069
Int. Cl.³ G11B *7/00, 9/00, 3/00*
U.S. Cl. 369—43 **2 Claims**



1. In a video disc playback apparatus the combination comprising:

a housing having supporting walls and a compliant support member at one end thereof;

a stylus;

a pickup arm supporting the stylus at one end thereof and having a second end;

a first bimorph longitudinally aligned with said pickup arm and having a first end fixedly attached to the second end of the pickup arm, first and second terminals, and, having second end, said first bimorph and pickup arm being arranged so that said first bimorph generates a signal at said first and second terminals responsive to lateral bending moments generated in said first bimorph;

a second bimorph having first and second ends and first and second terminals;

means fixedly attaching the first end of the second bimorph to the compliant support member to support lateral translation of the second end of said second bimorph in response to signals applied to its first and second terminals;

means fixedly attaching the second end of the first bimorph to the second end of the second bimorph, and connecting said pickup arm, first bimorph and second bimorph in longitudinal alignment and in tandem so that said first bimorph can impart lateral translational movement to the stylus;

circuit means responsive to signal potential at the terminals of the first bimorph for generating a control signal;

means for applying said control signal to the first and second terminals of the second bimorph.

4,310,914

SKIPPER-ASSISTED ACTIVE SEARCH

George H. N. Riddle, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 18, 1979, Ser. No. 85,870
Int. Cl.³ H04N *5/76;* **G11B** *21/00, 17/00*
U.S. Cl. 369—43 **6 Claims**

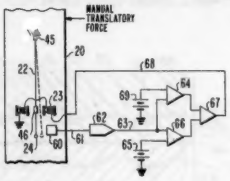
1. In a system for recovering prerecorded signals from a disc record having information recorded along a track disposed on the surface thereof by means of a track-following stylus which engages the disc record, said stylus movably mounted via a stylus arm on a carriage assembly and having a drive means for translating said carriage assembly and track-following stylus radially across the disc during normal playback, the combination for scanning the recorded information at a rate differing from normal playback comprising:

means for translating the carriage assembly in a scanning mode, said means subordinating the translatory motion imparted by said drive means;

detection means responsive to the relative position between

the stylus arm and thereby the track-following stylus and the carriage assembly for producing an electrical signal related to said relative position;

motive means responsive to said electrical signal for translating the stylus relative to the carriage assembly in a direction to restore the stylus-carriage positional relationship to a desired condition and thereby maintaining the average radial velocity of the stylus substantially equal to the carriage assembly velocity when the carriage is translated in said scanning mode.



4,310,915

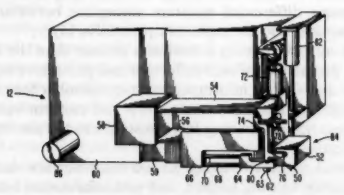
DUAL PARALLELOGRAM CUTTERHEAD SUSPENSION APPARATUS

John Gunter, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 26, 1979, Ser. No. 106,524

Int. Cl.³ G11B *17/00, 21/16*

U.S. Cl. 369—251 **7 Claims**



1. Apparatus for electromechanically recording information signals in a substrate comprising:

means for cutting undulations representative of information signals in a surface of said substrate, said cutting means having a tip, said undulations being cut in said substrate about a given nominal depth;

means for supporting said cutting means such that said cutting means cuts into said substrate surface to said given nominal depth;

means for maintaining a substantially parallel relationship between a surface of said supporting means and a surface of said substrate, said parallel maintaining means including a first pair of parallel resilient members;

means for maintaining a given relationship between said tip of said cutting means and said supporting means, said relationship maintaining means including a second pair of parallel resilient members; and

means for adjusting said relationship maintaining means such that said cutting means cuts into said substrate to said given nominal depth.

4,310,916

OPTICAL RECORD CARRIER AND APPARATUS FOR READING IT

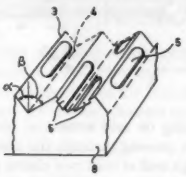
Jan G. Dil, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

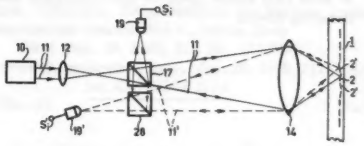
Filed Dec. 10, 1979, Ser. No. 102,174

Claims priority, application Netherlands, Sep. 27, 1979, 7907180

Int. Cl.³ G11B *7/24*

U.S. Cl. 369—109 **22 Claims**





1. A record carrier containing information stored in a form readable by a beam of radiation, said carrier comprising a substrate and at least one elongated track on a surface of said substrate, said track having at least two longitudinally extending surface portions, a first and second plurality of information areas adapted to produce a detectable change in a beam of radiation when illuminated by the beam, said information areas of said first plurality being disposed on one of said surface portions and spaced from each other in the longitudinal direction of said track to define a first information track and said information areas of said second plurality being disposed on the other of said surface portions and spaced from each other in the longitudinal direction of said track to define a second information track, said surface portions being inclined in different directions with respect to a line normal to said surface of said substrate and the longitudinal axis of said track so that when one of said first and second information tracks is illuminated by a read beam of radiation, the radiation incident on said one information track is deflected thereby in a first direction and radiation of the read beam incident on the other of said first and second information tracks is deflected thereby in a second direction which is different from said first direction thereby reducing crosstalk between said first and second information tracks.

4,310,917

PICK-UP

Bjarne S. Hansen, Fredensborg; Knud H. Andersen, Holte, and Robert Gudmandsen, Taastrup, all of Denmark, assignors to Ortofon Manufacturing A/S, Valby, Denmark

Filed Feb. 26, 1979, Ser. No. 14,992

Claims priority, application Denmark, Feb. 28, 1978, 904/78

Int. Cl.³ G11B *3/20*

U.S. Cl. 369—170 **6 Claims**

1. A pickup comprising:

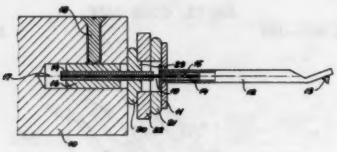
a supporting structure,

a stylus arm,

a relatively flat armature defining a plane disposed perpendicularly to said stylus arm at one end thereof, and

a combined bearing and damping device comprising at least two elastic pads and at least one inertial body located

therebetween, one of said at least two elastic pads having a substantially parallel side face parallel to said plane, and thus perpendicular to said stylus arm, and abutting on said supporting structure, and another of said at least two elastic pads having a substantially parallel side face parallel to said plane, and thus perpendicular to said stylus arm,



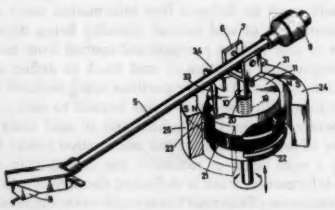
and abuttting on said armature, further comprising support means passing through the center of said stylus arm and through said at least two elastic pads of said combined bearing and damping device, and anchored in said supporting structure, for supporting said stylus arm and said at least two elastic pads of said combined bearing and damping device.

4,310,918

TONE ARM DRIVING APPARATUS

Isao Hirata, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 8, 1979, Ser. No. 92,638
Claims priority, application Japan, Nov. 15, 1978, 53-140672
Int. Cl.³ G11B *3/08*
U.S. Cl. 369—215 **10 Claims**



1. A tone arm driving apparatus comprising:

(a) a tone arm supported by a first and second axis so as to be rotatable in both a horizontal and vertical direction;

(b) a cylindrical bobbin arranged concentrically with said first axis and supported by said first axis so as to be rotatable around said first axis and slidable in the vertical direction;

(c) at least one each of a horizontal and vertical drive coil attached to said bobbin which, when supplied with electric currents, generate electromagnetic forces for imparting to said bobbin a torque and a vertical drive force;

(d) a stationary permanent magnet arranged facing said horizontal and vertical drive coils to interlink magnetic fluxes therefrom with said horizontal and vertical drive coils;

(e) a pin fixed to said bobbin for transmitting said torque from the bobbin to the tone arm; and

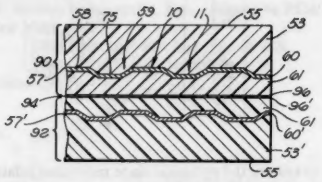
(f) an arm lifter fixed to said bobbin for transmitting said vertical drive force from the bobbin to the tone arm.

4,310,919

OPTICAL VIDEO DISC STRUCTURE

Gary G. Slaten, Fountain Valley, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Filed Jan. 15, 1979, Ser. No. 3,148
Int. Cl.³ A04N *5/76*
U.S. Cl. 369—275 **3 Claims**



1. An information storage member of the type readable using the relative motion between the member and a continuous reading light beam for retrieving the information carried by the member, said information storage member comprising:

a first disc-shaped information storage member formed of a plastic type material exhibiting a low and uniform value of birefringence and having a low resistance to the absorption of moisture;

said first member having at least an entrance surface and an information bearing surface;

said information bearing surface of said first member including as an integral portion thereof a spiral shaped information track formed from alternately positioned planar and non-planar regions;

a reflective layer positioned upon said information bearing surface of said first member for providing a light reflective surface;

a protective layer formed over said reflective layer and said protective layer having a low resistance to the absorption of moisture;

said reflective layer also being moisture impervious for preventing differential moisture absorption between said first member and its respective protective layer;

said first member having a thickness greater than the combined thicknesses of said reflective and protective layers;

a second disc-shaped information storage member formed of a plastic type material having a low and uniform value of birefringence and having low resistance to the absorption of moisture;

said second member having an entrance surface and an information bearing surface, and said information bearing surface of said second member including as an integral portion thereof a spiral shaped information track formed from alternately positioned planar and non-planar regions;

a reflective layer positioned upon said information bearing surface of said second member for providing a light reflective surface;

a protective layer formed over said reflective layer and said protective layer having low resistance to the absorption of moisture;

said last-mentioned reflective layer also being moisture impervious for preventing differential moisture absorption between said second member and said last mentioned protective layer;

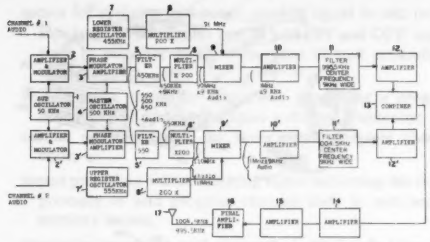
said second member having a thickness greater than the combined thicknesses of said last-mentioned reflective and protective layers; and

means for joining said protective layers with a high shear bond, said means for joining including a uniformly thick layer of adhesive for maintaining each of said information bearing surfaces equidistant one from the other, and said layer having a maximum thickness less than twenty-five microns for providing a bond with a high shear strength.

4,310,920
SINGLE SIDEBAND AM-FM STEREO MODULATION SYSTEM

William A. Hayes, 12 Schiller St., Hicksville, N.Y. 11801

Continuation-in-part of Ser. No. 756,811, Jan. 5, 1977, abandoned. This application Feb. 1, 1980, Ser. No. 117,505
Int. Cl.[3] H04J *1/02;* H04H *5/00*
U.S. Cl. 370—11 1 Claim



1. Means for generating a first single sideband of radio frequency with first audio modulation signal on the lower side of an assigned frequency, the first single sideband bandwidth being equal to the highest frequency of said first audio modulation signal,

means for generating a second single sideband of radio frequency with second audio modulation signal on the upper side of the assigned frequency, the second single sideband bandwidth being equal to the highest frequency of said second audio modulation signal,

said pair of generating means being operative for suppressing the assigned frequency signal so that it is not transmitted,

means connected to the generating means to combine the first and second single sideband signals,

whereby a receiver tuned to the assigned non-transmitted carrier frequency will receive both audio modulation signals,

wherein the means for generating a lower radio frequency and an upper radio frequency comprises:

a master oscillator generating a master frequency,

sub-carrier oscillator means,

first channel amplitude modulator means connected to the sub-carrier oscillator means,

first channel phase modulator means connected to the amplitude modulator means and to the master oscillator,

first channel bandpass filter means connected to the phase modulator means to pass a pre-determined spectrum of frequencies,

first channel first multiplying means connected to said filter means,

lower register oscillator means,

first channel second multiplier means connected to the lower register oscillator,

first channel mixing means connected to the first and second multipliers,

first channel first amplifier means connected to the output of said mixer,

first channel narrow band filter means connected to said first amplifier means, the filter passing a portion of the spectrum of frequencies containing the audio modulation,

first channel second amplifier means connected to the filter,

second channel amplitude modulator means connected to the sub-carrier oscillator means,

second channel phase modulator means connected to the amplitude modulator means and to the master oscillator,

second channel bandpass filter means connected to the second channel phase modulator means to pass a pre-determined spectrum of frequencies,

second channel first multiplying means connected to said second channel filter means,

upper register oscillator means,

second channel second multiplier means connected to the to the upper register oscillator,

second channel mixing means connected to the first and second channel multipliers,

second channel first amplifier means connected to the output of said second channel mixing means,

second channel narrow band filter means connected to said second channel first amplifier means, the filter passing a portion of the spectrum of frequencies containing the audio modulation,

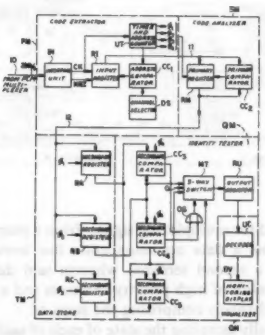
second channel second amplifier means connected to the second channel narrow band filter, and

said combining means connected to the first channel second amplifier means and the second channel second amplifier means.

4,310,921
PEAK-LEVEL DETECTOR FOR DIGITIZED SIGNALS IN PCM TELECOMMUNICATION SYSTEM

Nicola Rosa, Albairate, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Mar. 19, 1980, Ser. No. 131,749
Claims priority, application Italy, Mar. 20, 1979, 21131 A/79
Int. Cl.[3] H04J *3/14*
U.S. Cl. 370—13 7 Claims



1. In a telecommunication system in which a multiplexer interleaves bit groups from several communication channels, representing digitized signal-amplitude samples, in respective time slots of a recurrent data-stream frame individually assigned to said channels,

the combination therewith of a peak-level detector comprising:

selection means for extracting bit groups from time slots assigned to a given channel in successive frames of an incoming date stream;

a primary register connected to said selection means for receiving extracted bit groups and temporarily storing same;

primary comparison means with inputs connected to said selection means and to said primary register and with an output connected to a control input of said primary register for enabling same to receive and store only a bit group whose numerical value exceeds that of the current contents of said primary register;

a plurality of secondary registers with normally blocked input connections from said primary register;

timing means synchronized with the recurrence period of said frames for counting several series of successive frames and unblocking the input connection of a respective secondary register at the end of each of said series

with resulting transfer of the bit group last stored in each series from said primary register to the respective secondary register;

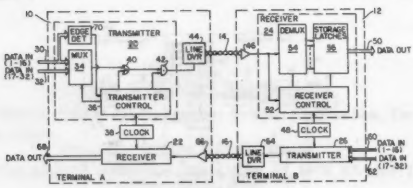
secondary comparison means with inputs connected to said secondary registers and controlled by said timing means for ascertaining an indentity between at least two bit groups stored in said secondary registers at the end of the last of said series; and

evaluation means connected to said secondary comparison means for indicating the numerical value of identical bit groups stored in said secondary registers.

4,310,922
BIT SAMPLING MULTIPLEXER APPARATUS

W. Wayne Lichtenberger, 19337 Sakura Way, Cupertino, Calif. 95014, and John R. Johnston, 56-419 Pikai St., Haleiwa, Hi. 96712

Filed Jan. 10, 1980, Ser. No. 110,803
Int. Cl.³ H04J *3/16, 3/06*
U.S. Cl. 370—48 **16 Claims**



1. A method for multiplexing signals from a plurality of data channels across a data communication line between a first terminal and a second terminal wherein said data channels include a plurality of high priority channels and a plurality of low priority channels comprising the steps of:

(a) periodically sampling the state of each of said plurality of data channels coupled to said first terminal at a rate substantially faster than the rate of change of data bits on each data channel;

(b) multiplexing said sampled data channel states into a serial bit string data frame;

(c) adding a frame synchronization signal to said data frame;

(d) coupling said serial data frame across said data communication line from said first terminal to said second terminal at a rate such that the sampled state obtained from each data channel can be serially coupled to said second terminal before the next sampling of each such data channel is made;

(e) demultiplexing said serial data frame into separate data channel states in said second terminal as a function of said frame synchronization signal in said data frame;

(f) storing each said data channel state in an output storage latch, each latch outputting a signal having the same state as the corresponding data channel as sampled by such first terminal;

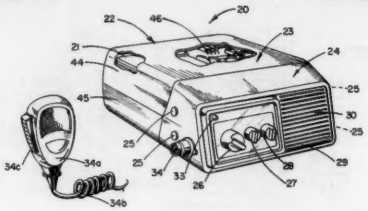
(g) detecting a change of state in one or more of said high priority data channels; and

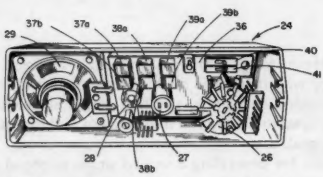
(h) in response to said detected state change, eliminating from the data frame presently being generated the low priority data channel states not yet multiplexed into said data frame.

4,310,923
TWO-WAY TRANSCEIVER INCLUDING FREQUENCY SYNTHESIZER

Edmund E. Kennedy, Shelbyville, Ind., assignor to General Aviation Electronics, Inc., Indianapolis, Ind.

Filed Mar. 23, 1979, Ser. No. 23,240
Int. Cl.³ H01B *1/38*
U.S. Cl. 455—79 **10 Claims**





1. A two-way business-band transceiver, comprising:

a transceiver housing enclosing a transceiver circuit,

a separable control head portion integral with the housing and containing controls including a channel-select switch with an external select knob for selecting one of a plural number of channels each having a plural digit frequency,

a set of plural individually adjustable frequency selection elements for each channel frequency, each of which controls the value of a different digit of that frequency,

the adjustable frequency selection elements being disposed within the control head portion of the housing and being inaccessible from outside the housing, the elements being positioned therein for convenient adjustment of their digit values to provide an internal adjustable multi-frequency changing capability for the external manual channel-select switch,

the transceiver circuit including a high-band frequency offset circuit means for providing an incremental frequency change from a first frequency setting located in the low-band range to a setting in the high-band frequency range.

4,310,924
CHANNEL PROGRAMMING APPARATUS FOR A SIGNAL RECEIVER

Tomoaki Miyasaka, and Toshio Amano, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 3, 1980, Ser. No. 109,337
Claims priority, application Japan, Jan. 11, 1979, 54-2096
Int. Cl.³ H03J *5/24*
U.S. Cl. 455—181 **7 Claims**

1. Programming apparatus for a signal receiver of the type having a tuner whose frequency is determined by a tuning control signal, and a power supply having an ON and an OFF condition and which can be switched from one to the other of said ON and OFF conditions in response to a power control signal, the programming apparatus comprising:

tuner control means for generating said tuning control signal when said power supply is switched to said ON condition, said tuning control signal having a predetermined characteristic for representing the frequency of the tuner;

timing means for generating a current time code representing the current time;

first input means for selectively generating a program time code representing a desired program time;

first memory means for storing said program time code;

coincidence detector means for comparing the current time code with the program time code stored in said first memory means and providing a coincidence signal when said current time code and the stored program time code bear a predetermined relation to one another;

means for applying said power control signal to said power supply to switch it into one of said ON and OFF conditions in response to an occurrence of said coincidence signal;

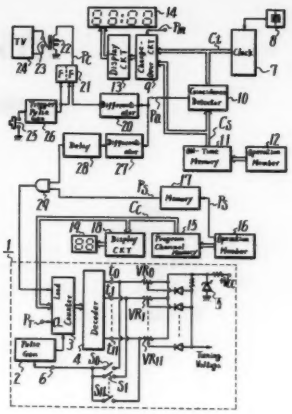
second input means for selectively generating a program channel code corresponding to a desired frequency;

second memory means for storing said program channel code;

means providing a discriminating signal indicating the stored presence of said program channel code in said second memory means;

means for supplying said program channel code from said second memory means to said tuner control means so that said tuning control signal has said characteristic determined for tuning said tuner to the desired frequency at the desired program; and

logic circuit means coupled to received said coincidence signal and said discriminating signal and permitting said tuner control means to receive said program channel code only upon occurance of both said coincidence signal and



said discriminating signal at input terminals of said logic circuit means.

DESIGN PATENTS

GRANTED JAN. 12, 1982

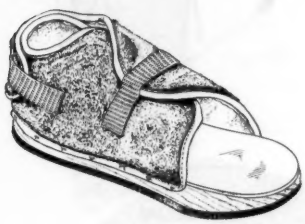
ERRATA

For CLASS	See PATENT NO.
D34–005	262,612
D34–034	262,613
D34–035	262,614

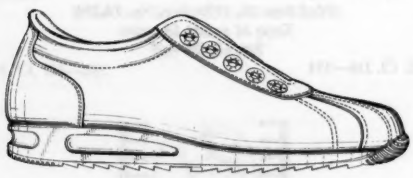
DESIGN PATENTS

GRANTED JAN. 12, 1982

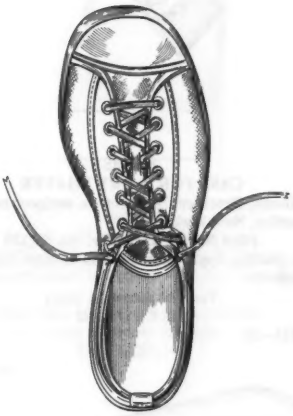
262,580
POST OPERATION SHOE
Dorothy G. Munschy, Bakersfield, Calif., assignor to Etta-Kit Enterprises, Bakersfield, Calif.
Filed Sep. 28, 1979, Ser. No. 79,945
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—264



262,581
SHOE
Jacques Chevallereau, Juvisy sur Orge, France, assignor to Raufast, S.A., Courcouronnes, France
Filed Apr. 11, 1979, Ser. No. 29,117
Claims priority, application France, Oct. 19, 1978, 78 56
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309



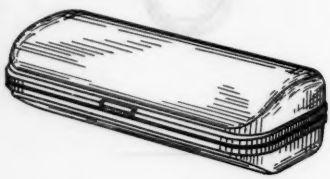
262,582
SPORTS SHOE AND THE LIKE
Timothy E. Moore, Hilton Inn Teanis Club, Reistertown Rd. at Beltway, Baltimore, Md. 21208
Filed Nov. 8, 1979, Ser. No. 92,287
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



262,583
COMBINED HEEL AND SOLE FOR WOMEN'S SHOES
Robert A. Radnick, 9849 Balfour Rd., Detroit, Mich. 48224
Continuation-in-part of Ser. No. 827,941, Aug. 26, 1977. This application Jan. 28, 1980, Ser. No. 115,995
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—322

262,584
SHOE SHANK
Ray G. Eisenhard, Akron, Pa., assignor to Coulson Heel Company, Inc., Hanover, Pa.
Filed Mar. 10, 1980, Ser. No. 128,538
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—314

262,585
CASE FOR A DRY SHAVER
Willem Anema, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 5, 1979, Ser. No. 91,229
Claims priority, application Benelux Designs Conv., May 10, 1979, 53686-00
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—39



262,586
HANDBAG
Mary S. Potter, 1020 Glann Rd., Toledo, Ohio 43607
Filed Jul. 19, 1979, Ser. No. 58,826
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—42

262,587
HANDBAG
Delores M. Hyers, Richmond, Va., assignor to De'Lanthe Creations Corporation, Richmond, Va.
Filed Feb. 19, 1980, Ser. No. 122,677
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—49

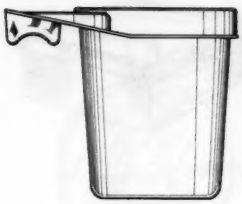
262,588
TABLE
Camillo Beltrame, 4713 N. Lauber Way, Tampa, Fla. 33614
Filed Apr. 9, 1979, Ser. No. 28,271
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

262,589
GARMENT RACK
Daniel E. Gelles, Kerhonkson, N.Y.
Filed Sep. 10, 1979, Ser. No. 74,394
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—191

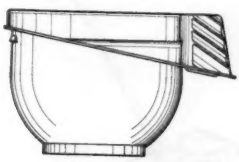
262,590
SEAT CUSHION
Herbert H. Trotman, and Helen H. Trotman, both of P.O. Box 807, Virginia Beach, Va. 23451
Continuation of Ser. No. 949,523, Oct. 10, 1978, which is a continuation of Ser. No. 783,214, Mar. 31, 1977. This application Aug. 24, 1979, Ser. No. 69,310
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—201

262,591
PHOTO MOUNT DEVICE
Kenneth J. Cardenas, 901 Windham St., Santa Cruz, Calif. 95060, and Dennis K. Browne, 218 Marcus, Aromas, Calif. 95004
Filed Aug. 21, 1978, Ser. No. 935,750
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—235

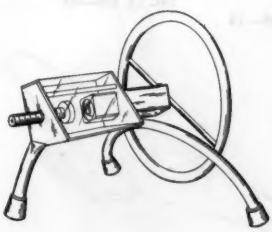
262,592
PLASTIC MUG
Adolf Zabner, Warwick, and Norman I. Bellemore, Esmond, both of R.I., assignors to Nyman Mfg. Co., East Providence, R.I.
Filed Feb. 25, 1980, Ser. No. 125,081
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9



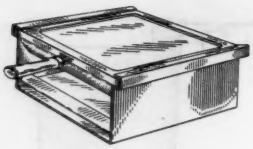
262,593
PLASTIC CUP
Adolf Zabner, Warwick, and Norman I. Bellemore, Esmond, both of R.I., assignors to Nyman Mfg. Co., East Providence, R.I.
Filed Jan. 15, 1980, Ser. No. 125,082
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—9



262,594
NUTCRACKER
Paul A. Yuker, 1408 Josephine St., Waukesha, Wis. 53186
Filed Dec. 3, 1979, Ser. No. 100,019
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—98

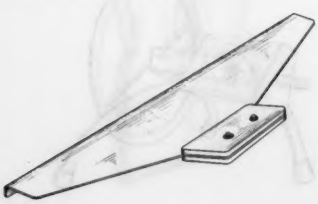


262,595
PORTABLE COOKSTOVE
Donald S. Martenson, 14935 S. Leland Rd., Beavercreek, Oreg. 97004
Filed Dec. 26, 1979, Ser. No. 107,440
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—110



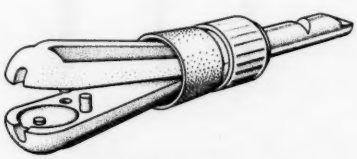
262,596
GARDEN TOOL
Garry J. Green, P.O. Box 162, Corydon, Iowa 50060
Filed Jan. 28, 1980, Ser. No. 115,994
Term of patent 3½ years
Int. Cl. D8—*01*
U.S. Cl. D8—11

262,597
PAINTER'S GUIDE
Ernest P. Rangel, 1386 N. Poplar, Fresno, Calif. 93728
Filed Jan. 16, 1980, Ser. No. 112,658
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14

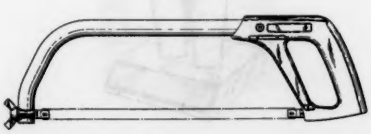


262,598
HAND TOOL FOR REMOVING AND REPLACING SPIRAL LOCK WASHERS FROM AND INTO ANNULAR GROOVES
Thomas R. Clark, Lexington, Ky., assignor to Harry C. Miller and Georgia R. Miller, both of Merritt Island, Fla.
Filed Mar. 22, 1979, Ser. No. 23,085
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—16

262,599
SCREW EYE VISE
Robert S. Wallace, Los Angeles, Calif., assignor to Dan F. Wallace, Karlua-Kona, Hi.
Filed Aug. 20, 1979, Ser. No. 68,159
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—86



262,600
SAW FRAME
Angus M. Crick, 111 Walker St., Ballarat 3350, Victoria, Australia
Filed Oct. 25, 1979, Ser. No. 88,460
Claims priority, application Australia, May 1, 1979, 77730
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—96



262,601

COMBINED CHANGEABLE PANEL HANDLE AND HUB HAVING LOCKING PIN AND KEY LOCK CYLINDER FOR SAFE DOORS AND THE LIKE

James P. Peppard, Nicholasville, Ky., assignor to Sargent & Greenleaf, Inc., Nicholasville, Ky.

Filed Aug. 17, 1979, Ser. No. 68,326

Term of patent 14 years

Int. Cl. D8—*06, 07*

U.S. Cl. D8—302

262,602

COMBINED HOOD AND IGNITION LOCK

David F. Arlasky, 3421 N. River Falls Dr., Northbrook, Ill. 60062

Filed Dec. 16, 1977, Ser. No. 861,297

Term of patent 14 years

Int. Cl. D8—*07*

U.S. Cl. D8—331

262,603

ATTACHMENT DEVICE FOR ATTACHMENT OF THE FRONTAL PROFILE BAR TO THE SWING ARMS OF A SUN-BLIND

Hans R. Brolin, Parkvägen 24, Mullsjö, Sweden

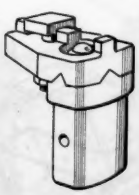
Filed May 18, 1979, Ser. No. 40,291

Claims priority, application Sweden, Nov. 22, 1978, 782726

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—400



262,604

DECANTER

Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 746,901, Dec. 2, 1976, abandoned. This application Mar. 5, 1979, Ser. No. 17,799

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—309

262,605

DECANTER

Adam J. Grodin, Forest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 746,660, Dec. 2, 1976, abandoned. This application Mar. 5, 1979, Ser. No. 17,800

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—309

262,606
PERFUME BOTTLE
Albert Kaufmann, Versoy-Geneve, Switzerland, assignor to Interdica, S.A., Villars-sur-Glane, Switzerland
Filed Mar. 19, 1979, Ser. No. 22,074
Claims priority, application Hague, Sep. 2, 1978, 67 587
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—337

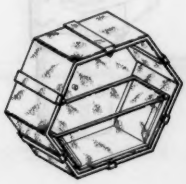
262,607
PULL TAB FOR A TEAR STRIP OPENER
Fred W. Drolen, Jr., Worth, and Salvador C. Mallorca, Chicago, both of Ill., assignors to The Continental Group, Inc., Stamford, Conn.
Filed Apr. 13, 1979, Ser. No. 29,948
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—438

262,608
DIGITAL CLOCK
Walter Drobshoff, 3616 Tunis Ave., San Jose, Calif. 95132, and Ivan H. Hamilton, 2431 Edsel Dr., Milpitas, Calif. 95035
Filed Jan. 25, 1980, Ser. No. 115,432
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

262,609
WRIST WATCH
Ronald Kurowsky, Birkenfeld, Fed. Rep. of Germany, assignor to Chopard & Cie, Geneva, Switzerland
Filed Feb. 8, 1980, Ser. No. 119,810
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

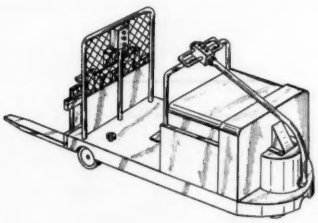
262,610
WIND POWERED BICYCLE REFLECTOR
Scott A. Westlake, and Thomas J. Westlake, both of 909 Seamas Ave., Sacramento, Calif. 95822
Filed Nov. 29, 1979, Ser. No. 98,401
Term of patent 14 years
Int. Cl. D10—*06;* D21—*01*
U.S. Cl. D10—111

262,611
PLANTER UNIT
Ben A. Gonzales, 1164 Elmsford Dr., Cupertino, Calif. 95014; Robert W. Shay, 14828 Nelson Way, San Jose, Calif. 95124, and Tom R. Romero, Jr., 1019 Wunderlich Dr., San Jose, Calif. 95129
Filed Jan. 15, 1980, Ser. No. 112,357
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—143

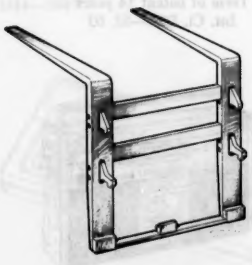


262,612
MOBILE REFUSE RECEPTACLE
Harold D. Rockman, 107 Second St., Fenton, Mich. 48420
Filed Feb. 5, 1979, Ser. No. 9,129
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—5

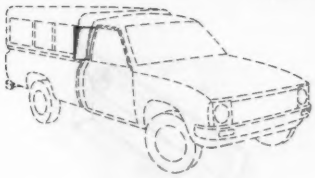
262,613
INDUSTRIAL TRUCK
Kenneth A. Frees, St. Peters, Mo., assignor to Missouri Research Laboratories Inc., St. Charles, Mo.
Filed Nov. 6, 1978, Ser. No. 958,165
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—34



262,614
INVERTED FORK WITH DETACHABLE SUSPENSION ATTACHMENTS FOR A FORK TRUCK
Kenneth Helgesson, Lidhult, Sweden, assignor to Kalmar Last Maskin Verkstad AB, Sweden
Filed Mar. 8, 1979, Ser. No. 18,580
Claims priority, application Sweden, Oct. 19, 1978, 782434
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D34—35

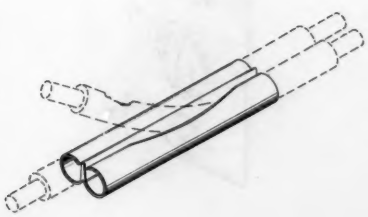


262,615
WIND WING
Marlon H. Thompson, 745 W. 6th, Winnemucca, Nev. 89445
Filed Mar. 19, 1979, Ser. No. 21,724
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181



262,616
VEHICLE WHEEL
John A. Main, Plymouth, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Jan. 14, 1980, Ser. No. 111,577
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211

262,617
JACKET INSULATION FOR PROTECTING DAMAGED TELEPHONE CONDUCTORS
Larry C. Shumate, 13206 Advance, Houston, Tex. 77065
Filed Apr. 11, 1979, Ser. No. 29,279
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—18



262,618

HOUSING FOR A FLOOR-MOUNTED MAGNETIC CONTACT SWITCH

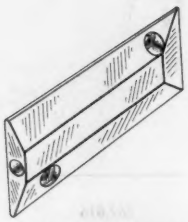
Thomas J. Holce, Portland, and Charles M. Huckins, Tigard, both of Oreg., assignors to Sentrol, Inc., Beaverton, Oreg.

Filed Nov. 29, 1978, Ser. No. 964,573

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—32



262,619

CONTROL PLATE FOR A ROOM AIR CONDITIONER

Victor Antos, Clifton, and Joseph R. Russo, Edison, both of N.J., assignors to National Union Electric Corporation, Greenwich, Conn.

Filed Feb. 8, 1979, Ser. No. 10,243

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—32

262,620

VIDEO DISC PLAYER

Tadashi Nagaoka, Nishinomiya; Kazuhiro Kawano, Neyagawa; Kenji Nambu, Moriguchi; Tadashi Saito, Hirakata, and Masakuni Ishibashi, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 12, 1979, Ser. No. 74,631

Claims priority, application Japan, Mar. 20, 1979, 54-11203

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—2

262,621

COMBINED CASSETTE RECORDER AND RADIO RECEIVER

Manao Nakamura, Ikoma; Masanori Hamada, Yao; Katsutoshi Kido, Kyoto; Benito Mishiro, Sakai, and Takao Okada, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 4, 1980, Ser. No. 117,924

Claims priority, application Japan, Aug. 2, 1979, 54-32435

Term of patent 14 years

Int. Cl. D14—*01, 03*

U.S. Cl. D14—5

262,622

CASE FOR AN INFORMATION DISPLAY TERMINAL OR THE LIKE

Anthony C. Beadle, Barnet; Keith E. Mintern, and John Stoddard, both of London, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

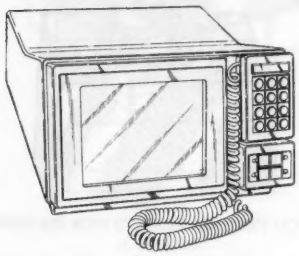
Filed May 16, 1979, Ser. No. 39,258

Claims priority, application United Kingdom, Aug. 1, 1978, 985739/78

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—106



262,623

ELECTRONIC TRANSLATOR

Munenori Fujimoto, Neyagawa, and Shuhei Taguchi, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

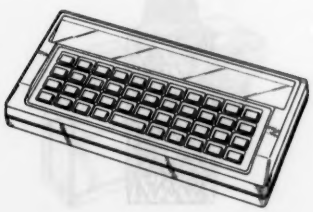
Filed Nov. 13, 1979, Ser. No. 93,560

Claims priority, application Japan, May 18, 1979, 54-20392

Term of patent 14 years

Int. Cl. D14—*02;* D18—*01*

U.S. Cl. D14—100



262,624

MOLDED BASE PLATE FOR A DESK TELEPHONE SET

Cesar Rico Gonzalez, Madrid, Spain, assignor to Amper, S.A., Madrid, Spain

Filed Jan. 30, 1979, Ser. No. 7,825

Claims priority, application Spain, Nov. 4, 1978, 93345

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—59

262,625

TELEPHONE STAND

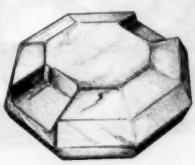
Donald M. Genaro, Haworth, N.J., and John N. McGarvey, Drexel Hill, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 12, 1979, Ser. No. 84,069

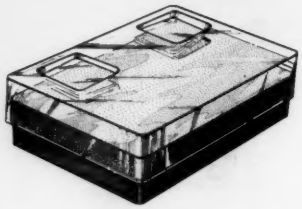
Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—60

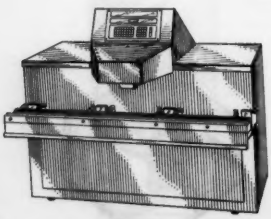


262,626
TELEPHONE STAND
Donald M. Genaro, Haworth, N.J., and John N. McGarvey, Drexel Hill, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Oct. 12, 1979, Ser. No. 84,523
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

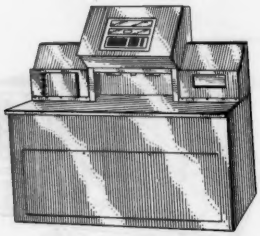


262,627
LIQUID APPLICATOR
Thomas J. David, Worthington; Jerome A. Waker, Casstown, and James F. Wilkinson, Worthington, all of Ohio, assignors to Chem-Lawn Corporation, Columbus, Ohio
Filed Aug. 15, 1979, Ser. No. 67,073
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—13

262,628
AUTOMATIC PAINT COLORANT DISPENSER
Harold L. Meyer, Wheaton, Ill., assignor to Miller Paint Equipment, Inc., Addison, Ill.
Filed Nov. 14, 1979, Ser. No. 94,199
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—122

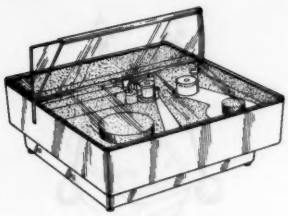


262,629
AUTOMATIC PAINT COLORANT DISPENSER
Harold L. Meyer, Wheaton, Ill., assignor to Miller Paint Equipment, Inc., Addison, Ill.
Filed Nov. 14, 1979, Ser. No. 94,202
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—122

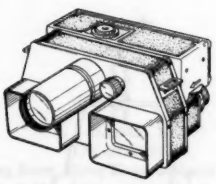


262,630
DRILL BIT
Clifford K. Logan, Jr., Oklahoma City, Okla., assignor to Robert W. Lee, Oklahoma City, Okla., a part interest
Filed Jan. 19, 1979, Ser. No. 4,687
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—139

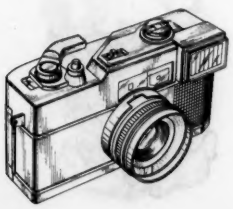
262,631
LABEL APPLYING MACHINE
Richard A. Branstner, Birmingham; Richard G. Clayton, Detroit; Jerry J. Sims, Southfield, and Jay Sucre, Grosse Pointe Farms, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.
Filed Jun. 7, 1978, Ser. No. 913,451
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D15—145



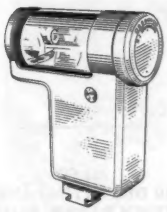
262,632
COMBINED BINOCULARS AND DETACHABLE CAMERA
Shogo Yamazaki, Tokyo, Japan, assignor to Ajia Amerikan Boueki Kabushiki Kaisha, Tokyo, Japan
Filed May 29, 1979, Ser. No. 43,593
Claims priority, application Japan, Feb. 27, 1979, 54-007282
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—1



262,633
CAMERA
Takaharu Kato, 20-2 Kamimeguro 1-Chome, Meguro-ku, Tokyo, Japan
Filed Sep. 27, 1978, Ser. No. 946,187
Claims priority, application Japan, Mar. 27, 1978, 53-11646
Term of patent 7 years
Int. Cl. D16—*01*
U.S. Cl. D16—06

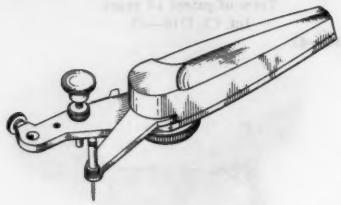


262,634
ELECTRONIC FLASH UNIT
Norbert Schlagheck; Herbert Schultes, both of Fuerstenfeldbruck, and Hermann R. Segers, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany
Filed Nov. 19, 1979, Ser. No. 95,539
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1979, 5MR568G164
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42



262,635
TRIPOD HEAD
Osamu Iwasaki, Tokorozawa, Japan, assignor to Slik Tripod Co., Ltd., Saitama, Japan
Filed Dec. 13, 1979, Ser. No. 103,172
Claims priority, application Japan, Jun. 19, 1979, 54-25209; Jun. 29, 1979, 54-26871
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—46

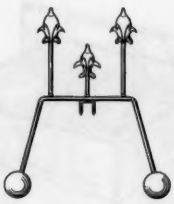
262,636
CONTROLLED LETTERING SCRIBER
Allister L. Baker, Deaville, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.
Filed May 23, 1980, Ser. No. 152,935
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—41



262,637
MACHINE FOR DISPLAYING AND ADVANCING STENOGRAPHIC NOTES
George A. Monick, 3075 N. Quincy St., Arlington, Va. 22207
Filed Feb. 6, 1980, Ser. No. 118,839
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91

262,638
CARCINOGEN WARNING MARKER
Lawrence B. Eichelberger, New Castle, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Nov. 14, 1979, Ser. No. 94,283
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D20—28

262,639
KINETIC SCULPTURE
Hidetoshi Matsui, 6, Imazunaka 3-chome, Tsurumi-ku, Osaka 538, Japan
Filed Jun. 25, 1979, Ser. No. 51,892
Claims priority, application Japan, May 25, 1979, 54-21557
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—102

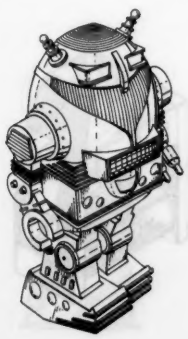


262,640
KINETIC SCULPTURE
Hidetoshi Matsui, 6, Imazunaka 3-chome, Tsurumi-ku, Osaka 538, Japan
Filed Jun. 25, 1979, Ser. No. 52,205
Claims priority, application Japan, May 25, 1979, 54-21553
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—102

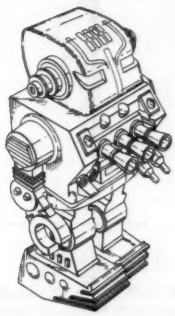
262,641
MUSICAL TOY LOCOMOTIVE
Shigeru Saitoh, Tokyo, Japan, assignor to Masuda Corporation Limited, Tokyo, Japan
Filed Dec. 6, 1979, Ser. No. 101,747
Claims priority, application Japan, Oct. 20, 1979, 54-44175
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—129

262,642
TOY WHEELBARROW
James F. Mariol, Cincinnati, Ohio, assignor to Design Alliance, Inc., Cincinnati, Ohio
Filed Feb. 4, 1980, Ser. No. 118,431
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134

262,643
TOY ROBOT
Hiu Wong, Hong Kong, Hong Kong, assignor to Blue Box Toy Factory Limited, Hong Kong, Hong Kong
Filed Dec. 14, 1979, Ser. No. 103,808
Claims priority, application United Kingdom, Jul. 3, 1979, 9905664/79
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150



262,644
TOY ROBOT
Hiu Wong, Hong Kong, Hong Kong, assignor to Blue Box Toy Factory Limited, Hong Kong, Hong Kong
Filed Dec. 14, 1979, Ser. No. 103,809
Claims priority, application United Kingdom, Jul. 3, 1979, 990563/79
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—150



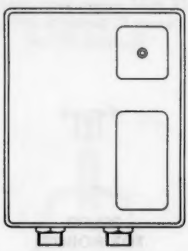
262,645
TOY ANIMAL FIGURE
Björn Alskog, Stockholm, Sweden, assignor to Plasto KB KY, Mariehamn, Finland
Filed May 25, 1979, Ser. No. 42,589
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—185

262,646
ROLLER SKATE POLE
David M. Mace, 16760 Sherman Way, Apt. 115, Van Nuys, Calif. 91401
Filed Jul. 30, 1979, Ser. No. 61,570
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—226

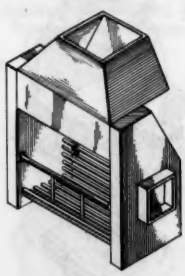
262,647
WATER CLOSET OR SIMILAR ARTICLE
Jack N. Kaiser, Danville, Ky., assignor to American Standard Inc., New York, N.Y.
Filed Jul. 21, 1980, Ser. No. 170,401
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—65

262,648
SPLASH SHIELD
George E. Lemmon, 2708 - 200th Southeast, Issaquah, Wash. 98027
Filed May 18, 1979, Ser. No. 40,231
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

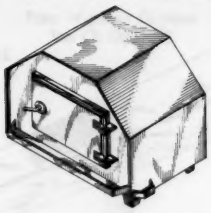
262,649
WATER HEATER
William G. S. Owen, St. Martin, Wales, assignor to IMI Santon Limited, Newport, Wales
Filed Aug. 30, 1979, Ser. No. 71,103
Claims priority, application United Kingdom, Apr. 24, 1979, 989637/79
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—86



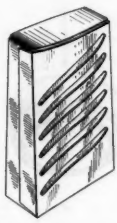
262,650
WOOD-BURNING FURNACE
James H. McConkey, Rte. 3, Malta, Ohio 43758
Filed Dec. 21, 1978, Ser. No. 972,072
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—93



262,651
WOOD STOVE
George D. Louderback, 1420 Coolidge St., Sterling, Colo. 80751
Filed Oct. 22, 1979, Ser. No. 87,384
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

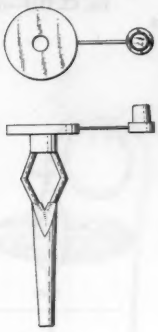


262,652
AIR FRESHENER DISPENSER
Harold R. Jaeschke, Milwaukee; Thomas R. Patmore, Elm Grove, both of Wis., and George Webinger, Minneapolis, Minn., assignors to Champion International Corporation, Stamford, Conn.
Filed Mar. 28, 1979, Ser. No. 24,853
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



262,653
INCUBATOR OXYGEN DOME
John K. Koh, 2593 Esch, Ann Arbor, Mich. 48104
Filed Jan. 14, 1980, Ser. No. 111,805
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1.1

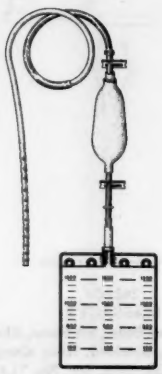
262,654
TEAT DILATOR
Mark L. Anderson, R.R. 2, Elmwood, Wis. 54740
Filed Oct. 31, 1979, Ser. No. 89,854
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—23



262,655
MASSAGER
Tam Sang, Yip Fat Factory Bldg., 8th Floor, Block C-D, 77, Hoi Yuen Rd., Kwun Tong, Kowloon, Hong Kong
Filed Aug. 30, 1979, Ser. No. 71,125
Claims priority, application United Kingdom, Mar. 6, 1979, 988881/79; Mar. 6, 1979, 988882/79
Term of patent 14 years
Int. Cl. D24—*04, 99*
U.S. Cl. D24—41

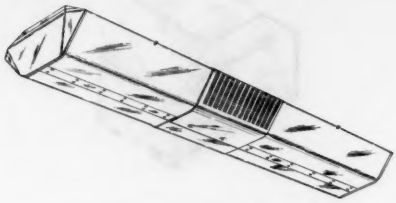
262,656
HOME COLONIC BOARD
Roy D. Johnson, 2425 Old Alturas Rd., Redding, Calif. 96001
Filed Jan. 4, 1980, Ser. No. 109,572
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—51

262,657
SUCTION DRAINAGE DEVICE FOR SURGICAL PURPOSES
Fred V. G. Ekbladh, Särö, Sweden, assignor to Astra-Sjuco Aktiebolag, Goteborg, Sweden
Filed Sep. 14, 1978, Ser. No. 942,394
Claims priority, application Sweden, Apr. 7, 1978, 949
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—58



262,658
DISPENSING BAG FOR FLUIDIC USES
William C. Christine, 341 St. John St., Catasauqua, Pa. 18032
Filed Jul. 26, 1979, Ser. No. 60,854
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—58

262,659
LIGHT BAR
Michael D. Latta, Ladue, and Thomas E. Wagner, Kirkwood, both of Mo., assignors to Public Safety Equipment, Inc., St. Louis, Mo.
Filed Dec. 5, 1979, Ser. No. 100,448
Term of patent 14 years
Int. Cl. D26—*06;* D10—*06*
U.S. Cl. D26—35



262,660
LUMINAIRE
Kenneth E. Fairbanks, Lafayette, Calif., and Douglas A. Bulleit, Atlanta, Ga., assignors to Gardco Manufacturing Inc., San Leandro, Calif.
Filed Jan. 8, 1980, Ser. No. 110,364
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—88

262,661
TABLE LAMP BASE
Gary W. Ramos, 2710 Pacheco Blvd., Los Banos, Calif. 93635
Filed Aug. 4, 1978, Ser. No. 931,115
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—94

262,662
LIGHTER
Franz A. Stuetzer, Muehlheim, and Bernd Figur, Rodgau, both of Fed. Rep. of Germany, assignors to Rowenta-Werke, GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Apr. 23, 1979, Ser. No. 32,201
Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 510144
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

262,663
BAR OF SOAP OR THE LIKE
Edwin F. Neu, and William J. O'Neil, Jr., both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 19, 1980, Ser. No. 150,864
Term of patent 14 years
Int. Cl. D28—*02*
U.S. Cl. D28—8.1

262,664
VANITY STAND
William G. Willits, Jr., 76 Drake Summit Rd., Inverness, Calif. 94937
Filed Mar. 5, 1980, Ser. No. 127,534
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—67

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF JANUARY, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Leiser, Roger S., 4,310,628, Cl. 435-94.000.

A/S Hoyer-Ellefsen: *See*—
Rivertz, Johan A., 4,310,052, Cl. 166-362.000.

Aaroe, Kenneth T. Shielded piezoelectric acoustic pickup for mounting on musical instrument sounding boards. 4,310,730, Cl. 179-110.00A.

AB Volvo: *See*—
Eng, Kjell, 4,310,718, Cl. 174-15.0WF.
Miller, Albert A.; and Wilson, Andrew G., 4,309,918, Cl. 74-867.000.

Abelitis, Andris, to Klockner-Humboldt-Deutz AG. Method and device for producing coal dust. 4,310,298, Cl. 432-14.000.

Abex Corporation: *See*—
Novotny, Raymond J., 4,310,125, Cl. 241-195.000.

Ableitner, Erich: *See*—
Sorsche, Joachim H.; Ableitner, Erich; Gobien, Ernst; and Minning, Manfred, 4,309,970, Cl. 123-198.00D.

Acebo, William F.: *See*—
Kahan, Hillard M.; Acebo, William F.; and Stafford, Michael K., 4,310,349, Cl. 75-0.50R.

ACF Industries, Incorporated: *See*—
Wempe, Richard J., 4,310,145, Cl. 251-144.000.

Achenbach, Karl; and Turk, Gunter, to DEGUSSA. Process for converting silicon dioxide containing waste flue dust to crystalline zeolitic molecular sieves of type A. 4,310,496, Cl. 423-118.000.

Adachi, Masahiro, to Nissan Motor Co., Ltd. Illuminating device for instrument. 4,310,871, Cl. 362-23.000.

Adam, Wilhelm: *See*—
Weber, Wilhelm; and Adam, Wilhelm, 4,310,447, Cl. 260-29.40R.

Adams, Charles D., to Du Pont de Nemours, E. I., and Company. Process for preparing a dialkyl propanediimidate dihydrohalide. 4,310,470, Cl. 260-453.700.

Adams, John, Jr. Multi-purpose furniture. 4,310,207, Cl. 312-314.000.

Adidas Sportschuhfabriken Adi Dassler KG: *See*—
Bente, Alfred, 4,309,834, Cl. 36-117.000.

AEG-Telefunken Societa Italiana per Azioni: *See*—
Bosco, Angelo, 4,310,378, Cl. 156-506.000.

AFA Corporation, The: *See*—
Wesner, Walter H., 4,310,107, Cl. 222-214.000.

AG-BAG Corporation: *See*—
Rasmussen, David H.; and Lee, Richard H., 4,310,036, Cl. 141-114.000.

Agarwal, Pawan K.; and Makowski, Henry S., deceased (by Makowski, Patricia H., executrix), to Exxon Research & Engineering Co. Hot melt adhesive compositions. 4,310,457, Cl. 260-235.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Le Pecq, Jean-Bernard; and Paoletti, Claude, 4,310,667, Cl. 546-70.000.

Agency of Industrial Science & Technology: *See*—
Tabata, Osamu; and Waseda, Mitoshi, 4,310,567, Cl. 427-82.000.

AGFA-Gevaert Aktiengesellschaft: *See*—
Meyer, Rudolf, 4,310,620, Cl. 430-404.000.
Odenwalder, Heinrich; Frank, Karl; and Muller, Reinhard, 4,310,621, Cl. 430-443.000.

AGFA-Gevaert N.V.: *See*—
De Geest, Wilfried F.; Verkinderen, Paul A.; and De Smedt, Felix F., 4,310,294, Cl. 425-174.80E.

Aida, Toshiyuki: *See*—
Fukushima, Hiroshi; Soeno, Ko; Ando, Hisashi; Yamamoto, Shigehiko; and Aida, Toshiyuki, 4,310,777, Cl. 313-345.000.

Ainoura, Masato. Method and apparatus for preparation of spherical hob for generation of gear. 4,309,926, Cl. 82-19.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Ikeda, Mituo, 4,310,076, Cl. 188-73.350.

Aitken, Robert M., to Imperial Chemical Industries Limited. Method and apparatus for the manufacture of fusecord. 4,310,324, Cl. 86-1.00R.

Aitken, Robert M., to Imperial Chemical Industries Limited. Method and apparatus for the manufacture of fusecord. 4,310,325, Cl. 86-1.00R.

Akamathu, Kohei: *See*—
Morita, Toru; Takahasi, Yasumasa; Akamathu, Kohei; and Inothume, Takasi, 4,310,819, Cl. 335-212.000.

Akamatsu, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Induction motor control system. 4,310,791, Cl. 318-800.000.

Akashi, Goro; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Magnetic recording element. 4,310,599, Cl. 428-413.000.

Akerkar, Anandrao S.; and Rutner, Herman, to Becton Dickinson & Company. Monoradioiodinated imidazole derivatives. 4,310,675, Cl. 548-336.000.

Aktiebolaget Svenska Flaktfabriken: *See*—
Bengtsson, Sune; and Lillestolen, Tom, 4,310,691, Cl. 562-584.000.

Aktieselskabet Nordiske Kabel- og Traadfabriker: *See*—
Nielsen, Ove; Nielsen, Leif; and Wanheim, Tarras, 4,309,885, Cl. 72-197.000.

Akzo N.V.: *See*—
Eveleens, Willem; Spaans, Johannes; and Wissink, Hendrik G., 4,310,689, Cl. 562-472.000.

Akzona Incorporated: *See*—
Schmitz, Arthur A., 4,310,592, Cl. 428-288.000.

Alafandi, Hamid; and Stamires, Dennis, to Filtrol Corporation. Large pore silica-alumina gels and method of producing the same. 4,310,441, Cl. 252-453.000.

Albers-Schonberg, George; Wallick, Hyman; Ormond, Robert E.; Miller, Thomas W.; and Burg, Richard W., to Merck & Co., Inc. Novel substances and process for their production. 4,310,519, Cl. 424-181.000.

Alcan Research and Development Limited: *See*—
Sheasby, Peter G.; Cheetham, Graham; Stuckart, Rainer W. M.; and Gupta, Tarun K. S., 4,310,586, Cl. 428-220.000.

Alexander, Carl J. Articulated saw. 4,309,931, Cl. 83-832.000.

Alfa Laval AB: *See*—
Brockwell, Ian P., 4,309,941, Cl. 99-453.000.

Allied Chemical Corporation: *See*—
DeBona, Bruce T.; and Prevorsek, Dusan C., 4,310,652, Cl. 528-125.000.

Allied Corporation: *See*—
DeCristofaro, Nicholas J., 4,310,381, Cl. 156-664.000.
Lazarus, Stanley D.; Cooke, Robert S.; and Galick, Paul E., 4,310,658, Cl. 528-309.000.
Masilamani, Divakaran; and Rogic, Milorad M., 4,310,702, Cl. 568-348.000.
Pickett, David A., 4,310,175, Cl. 280-801.000.
Reimschuessel, Herbert K.; and DeBona, Bruce T., 4,310,655, Cl. 528-176.000.
Rogers, Lloyd W., Jr.; and Stephenson, Robert L., 4,310,177, Cl. 280-802.000.
Yates, Samuel L.; Cole, Charles J.; Wiesner, Albert H.; and Wagner, John W., 4,310,659, Cl. 528-323.000.

Allis-Chalmers Corporation: *See*—
Kolacz, Ferdynand, 4,310,081, Cl. 192-4.00A.

Alps Electric Co., Ltd.: *See*—
Inoue, Ikutaro, 4,310,256, Cl. 400-185.000.

Alshin, Richard A.: *See*—
Wyman, Ransome J.; Alshin, Richard A.; and Gilbert, Charles H., 4,310,042, Cl. 152-322.000.

Althuber, Horst; and Prulamp, Helmut, to U.S. Philips Corporation. Braking mechanism, as for a tape recorder. 4,310,131, Cl. 242-204.000.

Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. Intermediates to 1,9-dihydroxyoctahydrophenanthrenes. 4,310,529, Cl. 424-263.000.

Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. Intermediates to 1,9-dihydroxyoctahydrophenanthrenes. 4,310,668, Cl. 546-204.000.

Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., to Pfizer Inc. Intermediates to 1,9-dihydroxyoctahydrophenanthrenes. 4,310,669, Cl. 546-206.000.

Altier, Anthony L. Archery bowstring release. 4,309,975, Cl. 124-35.00A.

Alza Corporation: *See*—
Theeuwes, Felix, 4,309,996, Cl. 128-260.000.

Amano, Toshio: *See*—
Miyasaka, Tomoaki; and Amano, Toshio, 4,310,924, Cl. 455-181.000.

American Air Filter Company, Inc.: *See*—
Hensiek, Charles R.; Mutchler, Paul A.; and Timms, Rayford W., 4,309,978, Cl. 126-110.00B.

American Brands, Inc.: *See*—
Hibbitts, Charles H.; Price, Byron F.; Cogbill, Everett C.; Kelly, James G.; and Glass, James E., 4,310,006, Cl. 131-290.000.

American Cyanamid Co.: *See*—
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, 4,310,672, Cl. 548-155.000.
Shepherd, Robert G., 4,310,543, Cl. 424-310.000.
Wissner, Allan; and Floyd, Middleton B., Jr., 4,310,700, Cl. 568-330.000.

American Hoechst Corp.: *See*—
Cross, Virginia R., 4,310,600, Cl. 428-447.000.

American Hospital Supply Corporation: *See*—
Aulik, Clarence J., 4,309,791, Cl. 16-35.00R.

Ames-Yissum Ltd.: *See*—
Derfler, Sara; Tamir, Yehuday; and Wagner, Daniel B., 4,310,504, Cl. 424-1.000.

AMF Incorporated: *See—*
Greenberg, Louis E., 4,310,157, Cl. 273-73.00C.

Amort, Jurgen: *See—*
Kotzsch, Hans-Joachim; Amort, Jurgen; and Vahlensieck, Hans-Joachim, 4,310,680, Cl. 556-467.000.

AMP Incorporated: *See—*
Bunnell, Edward D.; and Sotolongo, Thomas J., 4,310,211, Cl. 339-91.00R.
Fetterolf, James R., Sr.; Metzger, Donald L.; Snyder, Clair W., Jr.; and Wise, James H., 4,310,213, Cl. 339-103.00M.

Amper S.A.: *See—*
Gonzalez, Cesar R., 4,310,724, Cl. 179-18.0FA.

Ampex Corporation: *See—*
Holzgrafe, James R., 4,310,855, Cl. 358-210.000.
Kahan, Hillard M.; Acebo, William F.; and Stafford, Michael K., 4,310,349, Cl. 75-0.50R.

Amtel, Inc.: *See—*
Kentosh, James M., 4,309,955, Cl. 114-230.000.

Anchor Machine & Manufacturing, Inc.: *See—*
Raymond, Charles, 4,309,837, Cl. 43-8.000.

Anderle, Joseph A., to Levolor Lorentzen, Inc. Support for ceiling panels. 4,309,858, Cl. 52-632.000.

Andersen, Knud H.: *See—*
Hansen, Bjarne S.; Andersen, Knud H.; and Gudmandsen, Robert, 4,310,917, Cl. 369-170.000.

Anderson, Paul M.: *See—*
Kjelgaard, William L.; and Anderson, Paul M., 4,310,344, Cl. 71-61.000.
Kjelgaard, William L.; and Anderson, Paul M., 4,310,555, Cl. 426-69.000.

Anderson, Robert A.: *See—*
Welsh, James W.; and Anderson, Robert A., 4,310,181, Cl. 285-4.000.

Anderson, Ronald B.: *See—*
Beckley, Gary H.; Svendsen, Walter W.; and Anderson, Ronald B., 4,309,922, Cl. 81-57.160.

Ando, Hisashi: *See—*
Fukushima, Hiroshi; Soeno, Ko; Ando, Hisashi; Yamamoto, Shigehiko; and Aida, Toshiyuki, 4,310,777, Cl. 313-345.000.

Ando, Seigo: *See—*
Sano, Kazuo; Watanabe, Katsujiro; and Ando, Seigo, 4,309,902, Cl. 73-159.000.

Andrews, Reginald W. D., to Black & Decker Inc. Workbench. 4,310,150, Cl. 269-139.000.

Angelini, Edward J.: *See—*
Malki, Khaldoun W.; and Angelini, Edward J., 4,310,498, Cl. 423-242.000.

Angelo, Joseph: *See—*
Antolino, Angelo; Angelo, Vincent; and Angelo, Joseph, 4,309,823, Cl. 30-276.000.

Angelo, Vincent: *See—*
Antolino, Angelo; Angelo, Vincent; and Angelo, Joseph, 4,309,823, Cl. 30-276.000.

Annen, Heinz: *See—*
Christ, Alfred; and Annen, Heinz, 4,310,204, Cl. 308-9.000.

Anthon, Erik W.; and Jacobs, Carol. Cathode ray tube face plate construction for suppressing the halo and method. 4,310,784, Cl. 313-474.000.

Anthon, Erik W.: *See—*
Temple, Michael D.; Rancourt, James D.; and Anthon, Erik W., 4,310,783, Cl. 313-474.000.

Antolino, Angelo; Angelo, Vincent; and Angelo, Joseph, to Angelo, Vincent; and Angelo, Joseph. Rotary kitchen utensil. 4,309,823, Cl. 30-276.000.

Aoki, Shinichi: *See—*
Takeuchi, Koichi; Okada, Takeo; and Aoki, Shinichi, 4,310,736, Cl. 200-144.00B.

Aoki, Yoshihiro. Magnetic switch for attractive latch. 4,310,188, Cl. 292-251.500.

Aonuma, Shinichiro, to Toho Pharmaceutical Co., Ltd. Aspirin-isopropylantipyrine. 4,310,521, Cl. 424-232.000.

Aoshima, Masashi: *See—*
Maeda, Isamu; and Aoshima, Masashi, 4,310,443, Cl. 260-5.000.

Aoyama, Hiroshi: *See—*
JPX; Takahashi, Keiichi; Aoyama, Hiroshi; Hirakawa, Kikuya; and Sarusawa, Yukio, 4,309,952, Cl. 413-12.000.

Appel, Manfred; Moslener, Jorn; and Spiecker, Karl-Heinz, to Mannesmann DeMag AG. Apparatus for fanning out wire coils. 4,310,031, Cl. 140-2.000.

Applied Color Systems, Inc.: *See—*
Worn, Philip R.; Stanziola, Ralph A.; and Hall, Donald R., 4,310,314, Cl. 434-101.000.

Appoldt, Hans; Wagner, Werner; Hauck, Karl; and Baur, Reinhold, to BASF Aktiengesellschaft. Process for the manufacture of a jacket for a flexible disk for data recording. 4,310,371, Cl. 156-227.000.

Arai, Eisuke; Takagi, Fumio; Ishii, Yasuaki; and Kamei, Kuniaki, to Dai Nippon Insatsu Kabushiki Kaisha. Process for producing decorative articles. 4,310,370, Cl. 156-220.000.

Arai, Makoto: *See—*
Yuuki, Hironori; Inagaki, Kazunori; Arai, Makoto; Baba, Noboru; Yamada, Matsuichi; and Kurihara, Hiroshi, 4,310,813, Cl. 333-117.000.

Archie, William C., Jr.: *See—*
Mooberry, Jared B.; and Archie, William C., Jr., 4,310,612, Cl. 430-223.000.

Areaux, Larry D.: *See—*
Dudley, Robert H.; Areaux, Larry D.; and Dudley, Russell D., 4,310,417, Cl. 210-375.000.

Arman S.p.A.: *See—*
Maiocco, Guiseppe, 4,309,882, Cl. 70-186.000.

Armstrong Cork Company: *See—*
Felter, Richard E.; Emmons, Larrimore B.; Eshbach, John R., Jr.; and Posipanko, Thomas, 4,310,581, Cl. 428-109.000.

Arnaudeau, Marcel, to Institut Francais du Petrole. Method and apparatus for conveying through a pipe a diphasic fluid of high free gas content. 4,310,335, Cl. 55-46.000.

Arnold, Donald Arthur: *See—*
Sefton, Philip C., 4,310,835, Cl. 340-533.000.

Arnold, Lothar: *See—*
Nissen, Axel; Kaibel, Gerd; Woerz, Otto; Arnold, Lothar; Braun, Manfred; and Rebafka, Walter, 4,310,705, Cl. 568-391.000.

Aron nee Rosa, Daniele S.; and Griesemann nee Laporte, Michele-Gabrielle R. Process and apparatus for ophthalmic surgery. 4,309,998, Cl. 128-303.100.

Arrigoni, John P., to United Technologies Corporation. Turbine blade tip finishing apparatus. 4,309,848, Cl. 51-135.00R.

Arsac, Aime J.; and Frank, Pierre, to Produits Chimiques Ugine Kuhlmann. Process for the preparation of the dyestuff direct yellow 11 in the form of concentrated stable solutions, the solutions obtained and their applications. 4,310,331, Cl. 8-527.000.

Asada, Yoshimitus: *See—*
Ichikawa, Toshizi; Watanabe, Teruko; and Asada, Yoshimitus, 4,310,430, Cl. 252-60.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Ohmura, Kaoru; Shibasaki, Ichiro; Kimura, Takeo; and Kimura, Muneaki, 4,310,641, Cl. 525-419.000.

Asai, Koh, to Nippon Electric Co., Ltd. Device for extracting a density as one of pattern features for each feature point of a streaked pattern. 4,310,827, Cl. 340-146.30E.

Asano, Kiyoji, to Shinsei Kogyo Company, Ltd. Two-wheel toy vehicle with inertia flywheel. 4,309,841, Cl. 46-209.000.

Asano, Kiyomitsu; and Watanabe, Tetsuo, to Ricoh Co., Ltd.; and Nihon Tsushin Gijyutsu Kabushiki Kaisha. Printer with cartridge type wheel. 4,310,255, Cl. 400-171.000.

Asano, Masaharu: *See—*
Kaetsu, Isao; Yoshida, Masaru; and Asano, Masaharu, 4,310,397, Cl. 204-159.220.

ASEA Aktiebolag: *See—*
Halldin, Henry, 4,310,191, Cl. 295-31.00R.

Asmuth, Richard L., to Bell Telephone Laboratories, Incorporated. Method of identifying a calling station at a call terminating facility. 4,310,726, Cl. 179-18.00B.

Asselineau, Lionel: *See—*
Torck, Bernard; Convers, Alain; Asselineau, Lionel; and Hellin, Michel, 4,310,710, Cl. 568-697.000.

Ateliers des Charmilles, S.A.: *See—*
Pfau, Jean, 4,310,742, Cl. 219-69.00M.

Aubel, John A., to Borg-Warner Corporation. Differential pressure delay valve. 4,310,016, Cl. 137-493.800.

Auersbacher, Imre. Self igniting cigarette. 4,310,007, Cl. 131-329.000.

Aujla, Sharanjit S.; and Lee, John D., to Northern Telecom Limited. Retainer member with dual action cantilever beams. 4,310,212, Cl. 339-97.00R.

Aulik, Clarence J., to American Hospital Supply Corporation. Caster brake and swivel lock for stretcher or the like. 4,309,791, Cl. 16-35.00R.

Aurora Industries, Inc.: *See—*
Smillie, John G., 4,310,045, Cl. 164-527.000.

Auto-Register, Inc.: *See—*
Azcua, Noris S.; Margolin, George D.; Miller, Audrey; and Vurpillat, Victor V., 4,310,885, Cl. 364-405.000.

Automotive Products Limited: *See—*
Jarvis, Roger P.; and Parsons, David, 4,310,080, Cl. 192-4.00B.

Avions Marcel Dassault-Breguet Aviation: *See—*
Pierrat, Jean, 4,310,851, Cl. 358-109.000.

Azcua, Noris S.; Margolin, George D.; Miller, Audrey; and Vurpillat, Victor V., to Auto-Register, Inc. Point of sale terminal having prompting display and automatic money handling. 4,310,885, Cl. 364-405.000.

Azuma, Tomisaburo; Murakami, Takeru; and Date, Haruyuki, to Matsushita Electric Works, Ltd. Composition for forming inorganic hardened products and process for producing inorganic hardened products using the same. 4,310,358, Cl. 106-97.000.

B. F. Goodrich Company, The: *See—*
Dewitt, Elmer J., 4,310,637, Cl. 525-75.000.
Lai, John T., 4,310,429, Cl. 252-51.50A.

Baba, Noboru: *See—*
Yuuki, Hironori; Inagaki, Kazunori; Arai, Makoto; Baba, Noboru; Yamada, Matsuichi; and Kurihara, Hiroshi, 4,310,813, Cl. 333-117.000.

Babini, Giancarlo; Fabbri, Bruno; and Lucchini, Paolo, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Method of and system for analog/digital conversion. 4,310,830, Cl. 340-347.0AD.

Bacardit, Juan S., to Bendiberica S.A. Control valve for fluid actuated device. 4,310,024, Cl. 137-625.210.

Bachmann, Rudolf: *See—*
Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Kohl, Albert; Spoor, Herbert; Mahler, Karl; and Balz, Werner, 4,310,565, Cl. 427-48.000.

Baer, Ralph H., to Sanders Associates, Inc. Television captioning system. 4,310,854, Cl. 358-143.000.

Baessler, Konrad: *See—*
Muller, Helmut; and Baessler, Konrad, 4,310,711, Cl. 568-709.000.

Bahl, Om P., to Research Corporation. Antigen for early pregnancy test and contraceptive vaccine. 4,310,455, Cl. 260-112.00B.

Baier, Horst: *See—*
Bernauer, Otto; Baier, Horst; and Buchner, Helmut, 4,310,601, Cl. 428-566.000.

Bailey, Ronald L., to Young Dental Mfg. Co. Locking assembly for dental handpiece. 4,310,310, Cl. 433-126.000.

Bains, William R., to Ford Motor Company. Externally powered gun loading and ejection system. 4,309,933, Cl. 89-9.000.

Baker, Benjamin H.; and Taylor, David W., to General Motors Corporation. Digital frequency measuring circuitry. 4,310,800, Cl. 324-78.00D.

Baker, Don R.: *See—*
Fancher, Llewellyn W.; and Baker, Don R., 4,310,539, Cl. 424-326.000.

Baker, Garland W., to Esquire, Inc. Programmed controller. 4,310,828, Cl. 340-825.220.

Baker, Ian M.; and Withers, Richard B., to U.S. Philips Corporation. Manufacture of a group of infra-red detector elements, and a group so manufactured. 4,310,583, Cl. 428-209.000.

Baker, James M. Music playing apparatus. 4,309,932, Cl. 84-1.030.

Baker, John D., to Stewart-Warner Corporation. Programmable divider. 4,310,801, Cl. 328-48.000.

Baldeschwieler, John D.; Gamble, Ronald C.; Mauk, Marcia R.; Shen, Tsung-Ying; and Ponpipom, Mitree M., to California Institute of Technology. Lipid vesicles bearing carbohydrate surfaces as lymphatic directed vehicles for therapeutic and diagnostic substances. 4,310,505, Cl. 424-1.000.

Baldeschwieler, John D.; Gamble, Ronald C.; and Mauk, Marcia R., to California Institute of Technology. Means of preparation and applications of liposomes containing high concentrations of entrapped ionic species. 4,310,506, Cl. 424-1.000.

Ballard, Samuel S.; and White, Ronald P., to Sanders Associates, Inc. Ambient sea noise elimination method and apparatus. 4,310,904, Cl. 367-131.000.

Balslev, Jorgen; and Madsen, Laust O., to Jacob Holm Varde A/S. Reinforcing fibers and method of producing same corona treatment of thermoplastic fibers. 4,310,478, Cl. 264-22.000.

Balz, Werner: *See—*
Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Kohl, Albert; Spoor, Herbert; Mahler, Karl; and Balz, Werner, 4,310,565, Cl. 427-48.000.

Baney, Ronald H., to Dow Corning Corporation. High yield silicon carbide pre-ceramic polymers. 4,310,481, Cl. 264-65.000.

Baney, Ronald H., to Dow Corning Corporation. High yield silicon carbide pre-polymers. 4,310,482, Cl. 264-65.000.

Baney, Ronald H.; and Gaul, John H., to Dow Corning Corporation. Method for preparing silicon carbide. 4,310,651, Cl. 528-21.000.

Barabas, Eugene S.; Mallya, Prakash; and Gromelski, Stanley J., Jr., to GAF Corporation. Copolymerizable ultraviolet light absorber monomers which are acrylate esters of 2-hydroxy, alkoxy, methylol benzophenones. 4,310,687, Cl. 560-221.000.

Baran, Joseph: *See—*
Mowry, William H., Jr.; McElligott, Michael J.; Tkalenko, Victor J., Jr.; and Baran, Joseph, 4,310,180, Cl. 283-8.00B.

Bareel, Jean-Michel. Sliding element intended for use in skating. 4,310,588, Cl. 428-251.000.

Barl, Manfred: *See—*
Horacek, Heinrich; Barl, Manfred; Wurmb, Rolf; and Marx, Matthias, 4,310,632, Cl. 521-121.000.

Barns, Robert L.; and Chandross, Edwin A., to Bell Telephone Laboratories, Incorporated. Removal of —OH impurities from fiber optic precursor materials. 4,310,341, Cl. 65-3.120.

Bartholomew, Donald D. Quick connector for tubing. 4,310,185, Cl. 285-369.000.

Bartz, Kenneth W., to Exxon Research & Engineering Co. Copper adhesive composition. 4,310,636, Cl. 525-71.000.

BASF Aktiengesellschaft: *See—*
Appoldt, Hans; Wagner, Werner; Hauck, Karl; and Baur, Reinhold, 4,310,371, Cl. 156-227.000.
Gimpel, Juergen; Hartmann, Heinrich; and Schenck, Hans-Uew, 4,310,398, Cl. 204-181.00C.
Horacek, Heinrich; Barl, Manfred; Wurmb, Rolf; and Marx, Matthias, 4,310,632, Cl. 521-121.000.
Kempter, Fritz E.; Schupp, Eberhard; Schenck, Hans-Uwe; and Gulbins, Erich, 4,310,645, Cl. 525-526.000.
Kempter, Fritz E.; and Schupp, Eberhard, 4,310,646, Cl. 525-528.000.
Kohl, Lambert; Boehm, Udo; and Schulze-Berge, Klaus, 4,310,865, Cl. 360-106.000.
Kummer, Rudolf; Schneider, Heinz-Walter; Taglieber, Volker; and Weiss, Franz-Josef, 4,310,686, Cl. 560-204.000.
Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Kohl, Albert; Spoor, Herbert; Mahler, Karl; and Balz, Werner, 4,310,565, Cl. 427-48.000.
Nissen, Axel; Kaibel, Gerd; Woerz, Otto; Arnold, Lothar; Braun, Manfred; and Rebafka, Walter, 4,310,705, Cl. 568-391.000.
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,310,345, Cl. 71-76.000.
Rebafka, Walter, 4,310,709, Cl. 568-687.000.
Reissenweber, Gernot; and Mangold, Dietrich, 4,310,677, Cl. 560-22.000.
Schropp, Wilhelm K., 4,310,676, Cl. 560-4.000.
Volkamer, Klaus; Broellos, Klaus; Lindner, Alfred; Wagner, Ulrich; Weitz, Hans-Martin; and Schneider, Klaus-Juergen, 4,310,388, Cl. 203-51 000.

BASF Wyandotte: *See—*
Camp, Ronald L., 4,310,436, Cl. 252-316.000.

Basinski, Edward M., Jr., to United States of America, Air Force. Exhaust nozzle actuation assembly. 4,310,121, Cl. 239-265.330.

Bassett, David R.: *See—*
Wang, Alan E.; and Bassett, David R., 4,310,450, Cl. 260-29.60N.

Bastian, Lloyd E.: *See—*
Shaw, Anthony R.; Krueger, Wallace F.; and Bastian, Lloyd E., 4,310,116, Cl. 228-183.000.

Batcho, Andrew D.; Berger, Donald E., Jr.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Process and intermediates for the synthesis of vitamin D_3 metabolites. 4,310,467, Cl. 260-397.500.

Batson, Edward E., to Leesona Corporation. Trim press having hammer drive for punch. 4,309,929, Cl. 83-554.000.

Battersby, Charles D.: *See—*
Reilly, Philip C., Jr.; and Battersby, Charles D., 4,310,103, Cl. 221-15.000.

Bauer, Kurt; Hesch, Georg; Huber, Hans; Markert, Helmut; and Roth, Christian, to ITT Industries, Inc. Windshield wiper yoke. 4,309,790, Cl. 15-250.420.

Baum, Gerald L.: *See—*
Freed, Donald L., Jr.; and Baum, Gerald L., 4,310,199, Cl. 299-76.000.

Baur, Reinhold: *See—*
Appoldt, Hans; Wagner, Werner; Hauck, Karl; and Baur, Reinhold, 4,310,371, Cl. 156-227.000.

Baxter Travenol Laboratories, Inc.: *See—*
Brown, Richard I., 4,309,993, Cl. 128-214.00E.

Bayer Aktiengesellschaft: *See—*
Findeisen, Kurt; Freimuth, Reinhard; and Wagner, Kuno, 4,310,692, Cl. 564-61.000.
Finke, Ulrich; and Moretto, Hans-Heinrich, 4,310,679, Cl. 556-462.000.
Giesecke, Heinz; and Brack, Alfred, 4,310,664, Cl. 542-417.000.
Haas, Peter; Blahak, Johannes; and Wiedermann, Rolf, 4,310,633, Cl. 521-129.000.
Kolb, Fritz; Ziegert, Otto; and Fehlisch, Silvan, 4,310,069, Cl. 181-296.000.
Lantzsch, Reinhard; Marhold, Albrecht; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,310,540, Cl. 424-282.000.
Margotte, Dieter; Nouvertne, Werner; Neuray, Dieter; and Vernaleken, Hugo, 4,310,642, Cl. 525-468.000.
Pisaric, Karl H.; Weber, Karl-Arnold; Traubel, Harro; Brauner, Dieter; and Pahl, Manfred H., 4,310,493, Cl. 422-135.000.
Reischl, Artur, 4,310,448, Cl. 260-29.6NR.
Reischl, Artur, 4,310,449, Cl. 260-29.6NR.

Beach, David L.; and Harrison, James J., to Gulf Research & Development Company. Process for the oligomerization of ethylene in methanol. 4,310,716, Cl. 585-526.000.

Beall, George H.; and Pierson, Joseph E., to Corning Glass Works. Peraluminious nepheline/kalsilite glass-ceramics. 4,310,595, Cl. 428-332.000.

Bean, Stanley R. Key hole light illuminator. 4,310,873, Cl. 362-100.000.

Beaupre, Peter M., to King-Seeley Thermos Company. Fire resistant vapor barrier. 4,310,587, Cl. 428-246.000.

Bechtel International Corporation: *See—*
Mazzone, Frank L.; and Tegda, Joseph E., 4,310,769, Cl. 290-54.000.

Beck, James P., to Dana Corporation. Variable speed clutch drive. 4,310,322, Cl. 474-19.000.

Beckley, Gary H.; Svendsen, Walter W.; and Anderson, Ronald B., to Longyear Company. Rod break-out and make-up tool. 4,309,922, Cl. 81-57.160.

Beckman Instruments, Inc.: *See—*
Brown, James R.; and Diamond, Allen M., 4,310,243, Cl. 356-300.000.

Beckwith Electric Co., Inc.: *See—*
Wyatt, Michael A.; and Beckwith, Robert W., 4,310,771, Cl. 307-64.000.

Beckwith, Robert W.: *See—*
Wyatt, Michael A.; and Beckwith, Robert W., 4,310,771, Cl. 307-64.000.

Becton Dickinson & Company: *See—*
Akerkar, Anandrao S.; and Rutner, Herman, 4,310,675, Cl. 548-336.000.

Behrenz, Wolfgang: *See—*
Lantzsch, Reinhard; Marhold, Albrecht; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,310,540, Cl. 424-282.000.

Belart, Juan, to ITT Industries, Inc. Two circuit vacuum brake booster. 4,309,935, Cl. 91-376.00R.

Bell, Robert A., to General Electric Company. Electrochemical carbonate process. 4,310,393, Cl. 204-59.00R.

Bell Telephone Laboratories, Incorporated: *See—*
Asmuth, Richard L., 4,310,726, Cl. 179-18.00B.
Barns, Robert L.; and Chandross, Edwin A., 4,310,341, Cl. 65-3.120.
Eldumiati, Ismail I., 4,310,881, Cl. 364-200.000.
Flamm, Daniel L.; Maydan, Dan; and Wang, David N., 4,310,380, Cl. 156-643.000.
Fleming, Mills L.; Fuchs, George L.; Gladden, Robert H., Jr.; and Ross, Robert R., 4,310,209, Cl. 339-14.00R.
Heller, Adam, 4,310,405, Cl. 204-252.000.
Kohl, Paul A., 4,310,392, Cl. 204-52.00R.

Lawser, John J., 4,310,727, Cl. 179-18.00B.
Okinaka, Yutaka; and Smith, Craig G., 4,310,391, Cl. 204-46.00G.
Schaible, Clifford W., 4,310,722, Cl. 179-2.0EB.

Bellanca, Joseph V. Apparatus for folding paper. 4,310,326, Cl. 493-423.000.

Bellisario, Nolan. Dental audio and gaseous analgesia applicator. 4,310,307, Cl. 433-33.000.

Belrecolt: *See—*
Wattron, Albert, 4,309,863, Cl. 56-320.100.

Bender, Joseph, to Huebner Bros. of Canada Ltd. Heating assemblies. 4,310,745, Cl. 219-213.000.

Bendiberica S.A.: *See—*
Bacardit, Juan S., 4,310,024, Cl. 137-625.210.

Bendix Corporation, The: *See—*
Johannesen, Donald D.; and Haluda, Raymond P., 4,310,075, Cl. 188-73.450.
Karol, James J., 4,310,218, Cl. 350-96.210.
Mitrzyk, Jan C., Sr.; Gossoo, Rodney W.; Fischer, Charles P.; Silvernail, Howard N.; and Null, Charles, 4,309,928, Cl. 83-161.000.
Pauwels, Edward M., 4,310,201, Cl. 303-110.000.

Bengtsson, Sune; and Lillestolen, Tom, to Aktiebolaget Svenska Flaktfabriken. Method for selectively recovering sodium citrate from an aqueous solution. 4,310,691, Cl. 562-584.000.

Benson, Ronald C. Sandblasting machine. 4,309,850, Cl. 51-429.000.

Bente, Alfred, to Adidas Sportschuhfabriken Adi Dassler KG. Cross country ski boot. 4,309,834, Cl. 36-117.000.

Berejka, Anthony J., to Radiation Dynamics, Inc. Method of sealing an item in a covering comprising a composition of a polyethylene and isobutylene copolymer. 4,310,367, Cl. 156-85.000.

Berger, Donald E., Jr.: *See—*
Batcho, Andrew D.; Berger, Donald E., Jr.; and Uskokovic, Milan R., 4,310,467, Cl. 260-397.500.

Berger, Michel: *See—*
Demaire, Georges; Lys, Jacques; and Berger, Michel, 4,310,396, Cl. 204-151.000.

Berglund, Claire A.; and Rosso, Paul D., to Minnesota Mining and Manufacturing Company. Pressure-sensitive adhesive having a broad spectrum antimicrobial therein. 4,310,509, Cl. 424-28.000.

Bergner, Hans L.: *See—*
Jespersen, Knud; Buller-Colthurst, Guy E.; and Bergner, Hans L., 4,310,020, Cl. 137-563.000.

Berguer, Ramon. Intravascular implantation device and method of using the same. 4,309,776, Cl. 3-1.000.

Bergwerksverband GmbH: *See—*
Romey, Ingo; and Pass, Reinhard, 4,310,422, Cl. 210-769.000.
Schreiber, Anselm, 4,310,437, Cl. 252-361.000.

Bernauer, Otto; Baier, Horst; and Buchner, Helmut, to Daimler-Benz Aktiengesellschaft. Metal hydride storage device and method for its manufacture. 4,310,601, Cl. 428-566.000.

Bethlehem Steel Corporation: *See—*
Casler, Richard J., Jr., 4,310,850, Cl. 358-107.000.
Stavros, Anthony J., 4,310,572, Cl. 427-349.000.

Betz Laboratories, Inc.: *See—*
Steelhammer, Joe C.; Morrison, Ian D.; and Wittenbrook, Lawrence S., 4,310,438, Cl. 252-401.000.

Biesterbos, Johannes W. M.; and Dirks, Albertus G., to U.S. Philips Corporation. Thermomagnetic record carrier. 4,310,899, Cl. 365-113.000.

Biller, Joseph A. Tent camper for pickup truck. 4,310,194, Cl. 296-159.000.

Billington, Evans R.; and Odar, Larry F., to Rego Company. Thermal and remote valve control. 4,310,012, Cl. 137-75.000.

Billis, Albert E.: *See—*
Winnale, James A.; Rogers, Lloyd W., Jr.; Compeau, Edward E.; and Billis, Albert E., 4,310,179, Cl. 280-803.000.

Binasik, Chester S.; and Siegert, Louis D., to Coen Company, Inc. Method for firing a rotary kiln with pulverized solid fuel. 4,310,299, Cl. 432-14.000.

Biomedical Engineering Corp.: *See—*
Buechel, Frederick F.; and Pappas, Michael J., 4,309,778, Cl. 3-1.911.

Bird, Graham J.: *See—*
Serban, Alexander; Farquharson, Graeme; Lydiate, Jack; and Bird, Graham J., 4,310,347, Cl. 71-93.000.

Birkenmeyer, Robert D., to Upjohn Company, The. Lincomycin compounds. 4,310,660, Cl. 536-11.000.

Birkheuer, Horst V.: *See—*
Wenzel, Jurgen M.; and Birkheuer, Horst V., 4,310,278, Cl. 414-332.000.

Black & Decker Inc.: *See—*
Andrews, Reginald W. D., 4,310,150, Cl. 269-139.000.

Blahak, Johannes: *See—*
Haas, Peter; Blahak, Johannes; and Wiedermann, Rolf, 4,310,633, Cl. 521-129.000.

Blair Manufacturing Company: *See—*
Ryan, Kelly P., 4,310,252, Cl. 366-186.000.

Blakeslee, Theodore R., III, to Union Carbide Corporation. Method for extruding molten narrow molecular weight distribution, linear, ethylene copolymers. 4,310,484, Cl. 264-176.00R.

Blanchard, Clarence E., to Outboard Marine Corporation. Folding propeller with rubber hub. 4,310,285, Cl. 416-134.00R.

Blankenship, Michael G., to Corning Glass Works. Method and apparatus for forming an optical waveguide preform having a continuously removable starting member. 4,310,339, Cl. 65-3.120.

Blaszak, Joseph R., to Xerox Corporation. Low cost foam roll for electrostatographic reproduction machine. 4,309,803, Cl. 29-130.000.

Blazek, Vladimir. Photometer sphere. 4,310,246, Cl. 356-236.000.

Blizzard, John D.; and Swihart, Terence J., to Dow Corning Corporation. Liquid copolymeric organopolysiloxanes comprising SiO_2 and method therefor. 4,310,678, Cl. 556-451.000.

Block Drug Company Inc.: *See—*
Chang, Tiang-Shing; and Zientek, Lucy J., 4,310,516, Cl. 424-145.000.

Block, Kenneth A., to General Dynamics, Pomona Division. Laser proximity fuzing device. 4,309,946, Cl. 102-213.000.

Bobrov, Vladimir T.: *See—*
Maizenberg, Mikhail I.; Kaplan, Mikhail D.; Veremeenko, Stanislav V.; Bobrov, Vladimir T.; Moshkovich, Vladimir U.; Shapovalov, Petr F.; Troitsky, Vladimiru A.; Zhukovsky, Petr G.; and Komsky, Igor B., 4,309,905, Cl. 73-601.000.

Boehm, Udo: *See—*
Kohl, Lambert; Boehm, Udo; and Schulze-Berge, Klaus, 4,310,865, Cl. 360-106.000.

Boesch, William J.: *See—*
Fountain, Richard W.; Boesch, William J.; and Reichman, Steven H., 4,310,354, Cl. 75-211.000.

Bohg, Armin; and Briska, Marian, to International Business Machines Corporation. Solar collector with lens array. 4,309,985, Cl. 126-422.000.

Bolster, M. Elizabeth: *See—*
Liang, Charles C.; Bolster, M. Elizabeth; and Murphy, Robert M., 4,310,609, Cl. 429-194.000.

Bondeson, Leif S.; and Edner, Stig F., to Platmanufaktur AB. Conveyor for transport of bags of refuse. 4,310,089, Cl. 198-530.000.

Bongers, Bernd: *See—*
Brunsch, Klaus; Schindler, Rudolf; Bongers, Bernd; and Schulz, Ralf-Thilo, 4,309,865, Cl. 57-15.000.

Bonsack, James P., to SCM Corporation. Low-temperature fluid-bed chlorination of titaniferous ore. 4,310,495, Cl. 423-76.000.

Boomer, Daryl R.; and Boyer, Russell E., to Chevron Research Company. Pressure-controlled valve with small hold-up volume. 4,310,140, Cl. 251-5.000.

Boozer, John D. Livestock watering station. 4,309,962, Cl. 119-74.000.

Boragine, Carlo: *See—*
Mollet, Herbert; Oetiker, Alfred; and Boragine, Carlo, 4,310,617, Cl. 430-359.000.

Borca, Bruno: *See—*
Calza, Francesco; and Borca, Bruno, 4,310,262, Cl. 405-87.000.

Borchers, Karl: *See—*
Springmann, Hermann; and Borchers, Karl, 4,310,473, Cl. 260-504.00S.

Borg-Warner Corporation: *See—*
Aubel, John A., 4,310,016, Cl. 137-493.800.
Venema, Harry J., 4,309,871, Cl. 60-39.28R.
Wirth, William F., 4,310,866, Cl. 361-88.000.

Borvendeg, Janos: *See—*
Hajos, Andor; Fekete, Marton; Kurti, Marianna; Lang, Tibor; Toldy, Lajos; Borvendeg, Janos; Nagy, Laszlo; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,310,549, Cl. 424-330.000.

Boschetti, Eugene; and Lechevin, Jean-Claude, to Lipha, Lyonnaise Industrielle Pharmaceutique. Rodenticidal compositions. 4,310,536, Cl. 424-281.000.

Bosco, Angelo, to AEG-Telefunken Societa Italiana per Azioni. Tape splicing machine, in particular for magnetic tapes for loading into cassettes. 4,310,378, Cl. 156-506.000.

Boudakian, Max M., to Olin Corporation. Process for producing 2,6-dichloro-3-nitropyridine. 4,310,671, Cl. 546-304.000.

Bourgoyne, Adam T., Jr., to Otis Engineering Corporation. Well drilling apparatus. 4,310,050, Cl. 166-318.000.

Bourgoyne, Adam T., Jr., to Otis Engineering Corporation. Well drilling method. 4,310,058, Cl. 175-48.000.

Bourne, Richard G.: *See—*
Buddemeyer, Bruce D.; Neville, William A.; and Bourne, Richard G., 4,310,561, Cl. 426-601.000.

Bower, Lewis R.; and Scarfe, Arthur, to Fletcher Sutcliffe Wild Limited. Mining equipment. 4,310,268, Cl. 405-294.000.

Bowman, David F., to RCA Corporation. Transmission line hybrid junction. 4,310,814, Cl. 333-121.000.

Boyce, Jennings A., to Multiflex, Inc. Method and apparatus for forming a non-tensioned multi-conduit line. 4,309,869, Cl. 57-293.000.

Boyer & Adcock: *See—*
Boyer, Pierre J. R.; and Boyer, Jacques J. F., 4,310,752, Cl. 235-92.0PL.

Boyer, Jacques J. F.: *See—*
Boyer, Pierre J. R.; and Boyer, Jacques J. F., 4,310,752, Cl. 235-92.0PL.

Boyer, Pierre J. R.; and Boyer, Jacques J. F., to Boyer & Adcock. Electronic price conversion and display system adapted for installation on existing mechanical fluid dispensing pumps. 4,310,752, Cl. 235-92.0PL.

Boyer, Russell E.: *See—*
Boomer, Daryl R.; and Boyer, Russell E., 4,310,140, Cl. 251-5.000.

Brack, Alfred: *See—*
Giesecke, Heinz; and Brack, Alfred, 4,310,664, Cl. 542-417.000.

Bradley, David F.: *See—*
Isenberg, Arnold O.; and Bradley, David F., 4,310,402, Cl. 204-195.00S.

Bradley, Robert E.; and Keithler, William R., to Lockheed Corporation. Protective coating process for aluminum and aluminum alloys. 4,310,390, Cl. 204-37.00R.

Brager, Douglas R.; and Kappes, Randall J. Self-contained cleaner for trailer interiors. 4,309,788, Cl. 15-53.00A.

Braithwaite, John C.; and McGee, David J., to British Gas Corporation. Magnet assemblies with plural metallic foil contact members for pipeline inspection vehicles. 4,310,796, Cl. 324-220.000.

Brame, Durward B. Apparatus for extracting subterranean gas samples. 4,310,057, Cl. 175-21.000.

Brandt, Timothy B.: *See—*
Parr, Erwin W.; and Brandt, Timothy B., 4,310,018, Cl. 137-539.500.

Branson, John, to PYE (Electronic Products) Limited. Temperature controller. 4,310,047, Cl. 165-64.000.

Brauckmann, Wilhelm: *See—*
Vangermain, Erwin; Mengler, Claus-Dieter; Elm, Rainer; Ueberschaer, Horst; and Brauckmann, Wilhelm, 4,310,442, Cl. 252-455.00R.

Braun, Manfred: *See—*
Nissen, Axel; Kaibel, Gerd; Woerz, Otto; Arnold, Lothar; Braun, Manfred; and Rebafka, Walter, 4,310,705, Cl. 568-391.000.

Brauner, Dieter: *See—*
Pisaric, Karl H.; Weber, Karl-Arnold; Traubel, Harro; Brauner, Dieter; and Pahl, Manfred H., 4,310,493, Cl. 422-135.000.

Breazeale, Mack A.: *See—*
Cantrell, John H., Jr.; Heyman, Joseph S.; Yost, William T.; Torbett, Michael A.; and Breazeale, Mack A., 4,310,906, Cl. 367-181.000.

Brennan, Earl D., to Koppers Company, Inc. Process and apparatus for separating and purifying a crystalline material. 4,309,878, Cl. 62-542.000.

Brent, Rachael E. Devices for the support of stringed musical instruments. 4,310,111, Cl. 224-252.000.

Brentini, Attilio. Ring for attachment to keys or other objects. 4,309,883, Cl. 70-456.00R.

Bridgestone Tire Co., Ltd.: *See—*
Yamaguchi, Noboru, 4,309,956, Cl. 114-249.000.

Briggs, James D.; and Mizell, Ben. Solar window system. 4,309,981, Cl. 126-417.000.

Brill, Robert. Solar heat collector. 4,309,983, Cl. 126-422.000.

Briska, Marian: *See—*
Bohg, Armin; and Briska, Marian, 4,309,985, Cl. 126-422.000.

Bristol-Myers Company: *See—*
Cundall, Robert L.; and Walker, Derek, 4,310,459, Cl. 260-239.100.
Granatek, Edmund S.; Ziemba, Gerald M.; and Grab, Frederick L., 4,310,515, Cl. 424-131.000.
Walker, Derek; Silvestri, Herbert H.; Sapino, Chester; and Johnson, David A., 4,310,458, Cl. 260-239.100.

British Gas Corporation: *See—*
Braithwaite, John C.; and McGee, David J., 4,310,796, Cl. 324-220.000.

British Petroleum Company Limited, The: *See—*
Webb, Michael G., 4,310,415, Cl. 210-242.300.

Brockwell, Ian P., to Alfa Laval AB. Cheese making method and apparatus. 4,309,941, Cl. 99-453.000.

Broellos, Klaus: *See—*
Volkamer, Klaus; Broellos, Klaus; Lindner, Alfred; Wagner, Ulrich; Weitz, Hans-Martin; and Schneider, Klaus-Juergen, 4,310,388, Cl. 203-51.000.

Broggi, Renato: *See—*
Falciani, Marco; and Broggi, Renato, 4,310,460, Cl. 260-239.100.

Brooks, William R.; and Heinzel, Irving C. Foam medical cast. 4,309,990, Cl. 128-90.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Yokoe, Masaaki; and Kobayashi, Mituo, 4,309,809, Cl. 29-568.000.

Brough, Richard G. Ski device for sledding. 4,310,169, Cl. 280-12.00K.

Broughton, Philip, to International Computers Limited. Information storage arrangements. 4,310,902, Cl. 365-218.000.

Brouwer, Hendrik W., to Lever Brothers Company. Liquid soap composition. 4,310,432, Cl. 252-108.000.

Brown, Harold F.: *See—*
Brown, Steven F.; and Brown, Harold F., 4,310,423, Cl. 210-791.000.

Brown, James R.; and Diamond, Allen M., to Beckman Instruments, Inc. Spectrophotometer with photomultiplier tube dark signal compensation. 4,310,243, Cl. 356-300.000.

Brown, Richard I., to Baxter Travenol Laboratories, Inc. Liquid flow sensing apparatus. 4,309,993, Cl. 128-214.00E.

Brown, Steven F.; and Brown, Harold F. Stream water pumping means and method. 4,310,423, Cl. 210-791.000.

Brownlee, William L. Buoyant pipe system. 4,310,264, Cl. 405-172.000.

Brundige, Marie K. Kit for needlepoint work. 4,310,313, Cl. 434-95.000.

Brunelle, Daniel J., to General Electric Company. Polycarbonate transesterification. 4,310,656, Cl. 528-200.000.

Brunner, Alexander: *See—*
Martin, Gregory K.; and Brunner, Alexander, 4,310,751, Cl. 235-92.0MP.

Brunsch, Arwed; Ruh, Wolf D.; Schneider, Jochen; and Trippel, Gerhard, to International Business Machines Corporation. Apparatus for measuring magnetostriction constant. 4,310,798, Cl. 324-209.000.

Brunsch, Klaus; Schindler, Rudolf; Bongers, Bernd; and Schulz, Ralf-Thilo, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschrankter Haftung. Method and apparatus for producing windings of fiber compound material on a core. 4,309,865, Cl. 57-15.000.

Buchner, Helmut: *See—*
Bernauer, Otto; Baier, Horst; and Buchner, Helmut, 4,310,601, Cl. 428-566.000.

Buchwald, Robert W.: *See—*
Thekdi, Arvind C.; Buchwald, Robert W.; and Schmall, Robert A., 4,310,302, Cl. 432-205.000.

Buck, Dan F.: *See—*
Suggs, James L.; Buck, Dan F.; and Hobbs, Howard K., 4,310,556, Cl. 426-96.000.
Suggs, James L.; Buck, Dan F.; and Hobbs, Howard K., 4,310,557, Cl. 426-96.000.

Buck, Daniel C.; Hess, Ricky D.; and Niehenke, Edward C., to Westinghouse Electric Corp. Low noise microstrip voltage controlled oscillator. 4,310,809, Cl. 331-117.00D.

Budai, Zoltan; Jurak, Ferenc; Kis-tamas, Attila; Lay nee Konya, Aranka; Mezei, Tibor; Vig, Zoltan; and Zubovits nee Kristof, Terez, to Egyt Gyogyszervegyeszeti Gyar. Plant growth regulating compositions. 4,310,348, Cl. 71-121.000.

Budd, Edward J. Aligning apparatus for trailer boats. 4,309,785, Cl. 9-1.200.

Buddemeyer, Bruce D.; Neville, William A.; and Bourne, Richard G., to R.G.B. Laboratories, Inc. Protein-free synthetic milk or the like. 4,310,561, Cl. 426-601.000.

Budraitis, Tadas; and Seliga, Gerald W., to Productronix, Inc. Load monitor with selective sensor connection. 4,309,907, Cl. 73-771.000.

Buechel, Frederick F.; and Pappas, Michael J., to Biomedical Engineering Corp. New Jersey meniscal bearing knee replacement. 4,309,778, Cl. 3-1.911.

Buhler, Rudolf: *See—*
Girard, Henry; and Buhler, Rudolf, 4,310,630, Cl. 435-284.000.

Buller-Colthurst, Guy E.: *See—*
Jespersen, Knud; Buller-Colthurst, Guy E.; and Bergner, Hans L., 4,310,020, Cl. 137-563.000.

Bunn-O-Matic Corporation: *See—*
Stover, Kenneth W., 4,309,939, Cl. 99-280.000.

Bunnell, Edward D.; and Sotolongo, Thomas J., to AMP Incorporated. High current contact system for solar modules. 4,310,211, Cl. 339-91.00R.

Burch, Delton L. Forced airflow fireplace unit. 4,309,979, Cl. 126-131.000.

Burg, Richard W.: *See—*
Albers-Schonberg, George; Wallick, Hyman; Ormond, Robert E.; Miller, Thomas W.; and Burg, Richard W., 4,310,519, Cl. 424-181.000.

Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., to Petrolite Corporation. Quaternary ammonium adducts of polymerizable tertiary ammonium salts and acrylonitrile. 4,310,472, Cl. 260-465.400.

Burkhardt, Alan E.; and Tideman, Ann M., to Miles Laboratories, Inc. Interference-resistant composition, device and method for determining a peroxidatively active substance in a test sample. 4,310,626, Cl. 435-28.000.

Burns, Jerry W.: *See—*
Claude, George T.; and Burns, Jerry W., 4,310,172, Cl. 280-703.000.

Burron Medical Inc.: *See—*
Raines, Kenneth, 4,310,017, Cl. 137-533.000.

Burroughs Corporation: *See—*
Mowry, William H., Jr.; McElligott, Michael J.; Tkalenko, Victor J., Jr.; and Baran, Joseph, 4,310,180, Cl. 283-8.00B.

Burtonshaw, Donald W. H.: *See—*
Winterbottom, Malcolm L.; and Burtonshaw, Donald W. H., 4,310,327, Cl. 8-467.000.

Busbey, Sylvia S. Cookware with drainage lid. 4,310,418, Cl. 210-467.000.

Busch, David A.: *See—*
Wetterhorn, Richard H.; and Busch, David A., 4,310,133, Cl. 248-27.100.

Bush Boake Allen Inc.: *See—*
Schleppnik, Alfred A., 4,310,512, Cl. 424-76.000.

Butler, Richard A. Stud detector using a magnetically actuated switch with magnetic biasing. 4,310,797, Cl. 324-228.000.

Byer, Robert L.; and Herbst, Richard L., to Quanta-Ray, Inc. High power laser employing an unstable resonator. 4,310,808, Cl. 331-94.50C.

C. I. Kasei Co. Ltd.: *See—*
Kisida, Ichihei; Kobayashi, Takashi; and Matsushita, Masahisa, 4,310,118, Cl. 229-62.500.

Cabloptic S.A.: *See—*
Pellaux, Jean-Paul, 4,310,216, Cl. 350-3.720.

Cabo AG: *See—*
Eicher, Josef, 4,310,166, Cl. 280-5.280.

Caja, Josip: *See—*
Mark, Harry B., Jr.; Czerwinski, Andrzej; and Caja, Josip, 4,310,400, Cl. 204-195.00M.

Calhoun, Donald F., to Hughes Aircraft Company. Means and method of reducing the number of masks utilized in fabricating complex multilevel integrated circuits. 4,309,811, Cl. 29-574.000.

California Institute of Technology: *See—*
Baldeschwieler, John D.; Gamble, Ronald C.; Mauk, Marcia R.; Shen, Tsung-Ying; and Ponpipom, Mitree M., 4,310,505, Cl. 424-1.000.
Baldeschwieler, John D.; Gamble, Ronald C.; and Mauk, Marcia R., 4,310,506, Cl. 424-1.000.
Gupta, Amitava; and Yavrouian, Andre H., 4,310,650, Cl. 526-313.000.
Kalvinskas, John J.; Hsu, George C.; and Ernest, John B., 4,310,049, Cl. 166-267.000.

Caligen Foam Limited: *See—*
King, David A.; and Vallans, Sidney J., 4,309,844, Cl. 47-56.000.

Calviello, Joseph A., to Eaton Corporation. Field-effect transistors with micron and submicron gate lengths. 4,310,570, Cl. 427-89.000.
Calza, Francesco; and Borca, Bruno, to Pirelli/Furlanis Applicazioni. Collapsible dam and apparatus for raising and lowering the dam. 4,310,262, Cl. 405-87.000.
Cameron Iron Works, Inc.: *See—*
Church, Richard M., Jr.; and Williams, Bolie C., III, 4,310,139, Cl. 251-1.00B.
Camilleri, Thomas M., to Sycam Advanced Technology Corp. Shock absorber. 4,310,149, Cl. 267-136.000.
Cammack, Michael A.; and Mullins, Keith M., to Teledyne Industries, Inc. Adjustably conformable bed. 4,309,783, Cl. 5-508.000.
Camp, Ronald L., to BASF Wyandotte. Polyether-based thickeners with additives for increased efficiency in aqueous systems. 4,310,436, Cl. 252-316.000.
Campbell, Steve, to Pipe Systems, Incorporated. Polyolefin pipe connector sleeve. 4,310,184, Cl. 285-238.000.
Canadian General Electric Company Limited: *See—*
Paulin, William P., 4,310,748, Cl. 219-437.000.
Canadian Sun Systems Ltd.: *See—*
Dorbeck, Leo R., 4,309,984, Cl. 126-422.000.
Canellis, Peter; and Mock, Thomas H. Disposable dunnage system for transporting vehicles. 4,310,271, Cl. 410-13.000.
Canon Kabushiki Kaisha: *See—*
Ikemori, Keiji, 4,310,222, Cl. 350-432.000.
Konishi, Yuichiro; Kitagishi, Nozomu; and Sumi, Akiyasu, 4,310,231, Cl. 354-79.000.
Momiyama, Kikuo; and Yamaguchi, Shin, 4,310,221, Cl. 350-431.000.
Cantrell, John H., Jr.; Heyman, Joseph S.; Yost, William T.; Torbett, Michael A.; and Breazeale, Mack A., to United States of America, Administrator, National Aeronautics and Space Administration. Liquid-immersible electrostatic ultrasonic transducer. 4,310,906, Cl. 367-181.000.
Capitol Products Corporation: *See—*
Schmidt, Dietrich F., 4,309,845, Cl. 49-501.000.
Capro, Inc.: *See—*
Carlson, John A., 4,309,862, Cl. 56-10.500.
Carefree Bicycle Tire Company: *See—*
Wyman, Ransome J.; Alshin, Richard A.; and Gilbert, Charles H., 4,310,042, Cl. 152-322.000.
Carl Freudenberg, Firma: *See—*
Schuhmacher, Gunter; Fahrbach, Erich; and Wagner, Sepp, 4,310,373, Cl. 156-308.200.
Carlsen, George D., II, to Dynamic Compliance, Incorporated. Thermal motion transducer. 4,310,731, Cl. 179-110.00F.
Carlson, Albert W. D., to Rivercross Learning Corp. Electronic game. 4,310,318, Cl. 434-339.000.
Carlson, John A., to Capro, Inc. Lawn mower and controls therefor. 4,309,862, Cl. 56-10.500.
Carlson, Russell L.; and Schaefer, William H., to United Technologies Corporation. High speed rotary atomization means for making powdered metal. 4,310,292, Cl. 425-8.000.
Carlson, William R. Tiltable terminal clamp assembly. 4,310,214, Cl. 339-246.000.
Carnahan, James C., Jr., to General Electric Company. Polyethersulfoneformals. 4,310,654, Cl. 528-174.000.
Carnation Company: *See—*
Doster, Robert C.; and Nelson, Sharon L., 4,310,560, Cl. 426-285.000.
Carrier Corporation: *See—*
Guest, Neil A.; and Krisner, James F., 4,309,870, Cl. 60-39.080.
Leonard, Gary S.; and Zinsmeyer, Thomas M., 4,309,876, Cl. 62-79.000.
Carter Equipment Co., Inc.: *See—*
Carter, William D.; and Mueller, Martin S., 4,310,848, Cl. 358-76.000.
Carter, James R.; and Willard, Hope L. Game finder hunting bow combination. 4,309,974, Cl. 124-23.00R.
Carter-Wallace, Inc.: *See—*
Stiefel, Frank J., 4,310,674, Cl. 548-215.000.
Carter, William D.; and Mueller, Martin S., to Carter Equipment Co., Inc. Colorimetric evaluation of photographic film. 4,310,848, Cl. 358-76.000.
Cashin Systems Corporation: *See—*
Dennis, Edmund G.; and Dillon, Oscar W., 4,309,927, Cl. 83-77.000.
Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,310,861, Cl. 360-50.000.
Casler, Richard J., Jr., to Bethlehem Steel Corporation. Solid-state video camera having a video signal processor. 4,310,850, Cl. 358-107.000.
Cassella Aktiengesellschaft: *See—*
Dorries, Peter; and Keil, Karl-Heinz, 4,310,355, Cl. 106-2.000.
Weber, Wilhelm; and Adam, Wilhelm, 4,310,447, Cl. 260-29.40R.
Castagnoli, Guiseppe, to Elettronica San Giorgio ELSAG S.p.A. Machine for sorting objects of various destinations particularly suitable for bulky postal correspondence. 4,310,276, Cl. 414-134.000.
Castle, Thomas M.: *See—*
Dolak, Lester A.; Laborde, Alice L.; and Castle, Thomas M., 4,310,627, Cl. 435-84.000.
Cavitron Corporation: *See—*
Weilbach, August; Ragsdale, Charles W.; and Perkins, Corles M., 4,310,224, Cl. 351-23.000.
Centro Ricerche Fiat S.p.A.: *See—*
Manfre, Giovanni; Mironi, Jonathan; and Moschini, Renzo, 4,310,352, Cl. 75-93.00R.
Certain-Teed Corporation: *See—*
Janssen, Kermit W.; and Mitchell, Andrew, 4,310,372, Cl. 156-245.000.
Chabin Corporation: *See—*
Webster, John L.; and Venaleck, John T., 4,310,208, Cl. 339-14.00R.
Champion International Corporation: *See—*
Fremont, Henry A.; Obenour, Mary C.; and Hedrick, Edward F., 4,310,424, Cl. 210-791.000.
Chan, David C. K., to Chevron Research. 3-(N-Arylamino)-gamma-butyrolactones, butyrolactams and thiobutyrolactones are intermediates for compounds having fungicidal activity. 4,310,463, Cl. 260-343.600.
Chandross, Edwin A.: *See—*
Barns, Robert L.; and Chandross, Edwin A., 4,310,341, Cl. 65-3.120.
Chang, Tiang-Shing; and Zientek, Lucy J., to Block Drug Company Inc. Cosmetic and pharmaceutical vehicle thickened with solid emulsifier. 4,310,516, Cl. 424-145.000.
Charkey, Allen: *See—*
Dodin, Mark G.; and Charkey, Allen, 4,310,608, Cl. 429-131.000.
Charpentier, Robert: *See—*
Mimoun, Hubert; Charpentier, Robert; and Roussel, Michel, 4,310,704, Cl. 568-385.000.
Chaudot, Gerard; Ombret, Rene; and Zimmerman, Paul, to Societe Nationale Elf Aquitaine. Heat-shield for gas-burning flare in oil production installations, particularly platforms at sea. 4,310,296, Cl. 431-5.000.
Check, Frank T., Jr., to Pitney Bowes Inc. Computer accessing system. 4,310,720, Cl. 178-22.080.
Check, Frank T., Jr., to Pitney Bowes Inc. Communication means with transducer physically spaced from interior wall of secure housing. 4,310,754, Cl. 235-454.000.
Check, Frank T., Jr.; and Sansone, Ronald P., to Pitney Bowes Inc. Apparatus for correcting scanning speed in a polygon used for laser scanning. 4,310,757, Cl. 250-236.000.
Checkland, John A.; and Valois, Paul, to Northern Telecom Limited. Low voltage electrical wire. 4,310,597, Cl. 428-383.000.
Cheetham, Graham: *See—*
Sheasby, Peter G.; Cheetham, Graham; Stuckart, Rainer W. M.; and Gupta, Tarun K. S., 4,310,586, Cl. 428-220.000.
Chemap AG: *See—*
Girard, Henry; and Buhler, Rudolf, 4,310,630, Cl. 435-284.000.
Chemetals Corporation: *See—*
Welsh, Jay Y., 4,310,494, Cl. 423-49.000.
Cheminal, Bernard; Kiener, Paul; and Traversaz, Aime, to Produits Chimiques Ugine Kuhlmann. Process for the manufacture of dimethylethylamine. 4,310,697, Cl. 564-479.000.
Chemische Werke Huls AG: *See—*
Springmann, Hermann; and Borchers, Karl, 4,310,473, Cl. 260-504.00S.
Vangermain, Erwin; Mengler, Claus-Dieter; Elm, Rainer; Ueberschaer, Horst; and Brauckmann, Wilhelm, 4,310,442, Cl. 252-455.00R.
Cheng, Chia-Chung: *See—*
Zee-Cheng, Robert K.; and Cheng, Chia-Chung, 4,310,666, Cl. 544-380.000.
Chester, John, to Feroda Limited. Friction materials. 4,310,452, Cl. 260-38.000.
Chevron Research: *See—*
Chan, David C. K., 4,310,463, Cl. 260-343.600.
Feffer, Philip C., 4,309,801, Cl. 28-248.000.
Chevron Research Company: *See—*
Boomer, Daryl R.; and Boyer, Russell E., 4,310,140, Cl. 251-5.000.
Roberts, F. Alexander; Stiles, William V.; Cosbey, Robert C.; and Duncan, John P., 4,310,884, Cl. 364-578.000.
Chiang, David: *See—*
Manber, Solomon; Chiang, David; and Chu, Mosi, 4,310,226, Cl. 354-5.000.
Chiesa, Alan F.; Evans, David G.; Norford, James R.; and Zahorchak, John A., to General Motors Corporation. Adaptive air/fuel ratio controller for internal combustion engine. 4,309,971, Cl. 123-480.000.
Chirichigno, Jerry. Cable cover slitting tool. 4,309,822, Cl. 30-90.900.
Chojnacki, Dennis A.: *See—*
Mayers, Richard R.; and Chojnacki, Dennis A., 4,310,301, Cl. 432-121.000.
Chong, Carlos F.: *See—*
Harding, Phillip A.; Chong, Carlos F.; and Pockell, Herman L., 4,310,901, Cl. 365-200.000.
Choy, Clement K.; and Greene, Robert A., to Procter & Gamble Company, The. Poly(ethylene oxide) compositions with controlled solubility characteristics. 4,310,434, Cl. 252-174.210.
Christ, Alfred; and Annen, Heinz, to Escher Wyss Limited. Hydrostatic support apparatus. 4,310,204, Cl. 308-9.000.
Christensen, Burton G.; and Ratcliffe, Ronald W., to Merck & Co., Inc. 3-Halo-1-azabicyclo[3.2.0]hept-2-en-7-one-2-carboxylic acid. 4,310,538, Cl. 424-274.000.
Christensen, Inc.: *See—*
Moore, Norman B., 4,310,059, Cl. 175-320.000.
Chromalloy Electronics Corporation: *See—*
Kayman, Arnold I., 4,310,065, Cl. 181-159.000.
Chrysler Corporation: *See—*
Harbulak, Edward P., 4,310,389, Cl. 204-1.00T.

Chu, Mosi: *See—*
Manber, Solomon; Chiang, David; and Chu, Mosi, 4,310,226, Cl. 354-5.000.
Chugoku Marine Paints, Ltd.: *See—*
Tabata, Osamu; and Waseda, Mitoshi, 4,310,567, Cl. 427-82.000.
Church, Richard M., Jr.; and Williams, Bolie C., III, to Cameron Iron Works, Inc. Annular blowout preventer. 4,310,139, Cl. 251-1.00B.
Ciba-Geigy AG: *See—*
Mollet, Herbert; Oetiker, Alfred; and Boragine, Carlo, 4,310,617, Cl. 430-359.000.
Ciba-Geigy Corporation: *See—*
Cooke, Thomas W., 4,310,698, Cl. 568-46.000.
Dorfel, Werner H.; Medinger, Bernhard; and Troxler, Eduard, 4,310,483, Cl. 264-117.000.
Ehrenfreund, Josef, 4,310,548, Cl. 424-322.000.
Ehrenfreund, Josef, 4,310,694, Cl. 564-442.000.
Jaeggi, Knut A.; Ostermayer, Franz; and Schroter, Herbert, 4,310,527, Cl. 424-251.000.
Michaelis, Klaus-Peter; and Muller, Horst, 4,310,454, Cl. 260-45.75S.
Cilione, Augustine, to U.S. Industries, Inc. Apparatus and method for applying a snap fastener to a sheet material. 4,309,806, Cl. 29-432.100.
Ciuti, Brunello, to Snamprogetti, S.p.A. Lubricants, and process for thickening organic liquids. 4,310,428, Cl. 252-33.000.
Clabburn, Robin J. T.: *See—*
Hill, Frederick W. L.; and Clabburn, Robin J. T., 4,309,807, Cl. 29-446.000.
Clark Equipment Company: *See—*
Davis, Dean E., 4,310,072, Cl. 187-9.00R.
Claude, George T.; and Burns, Jerry W., to General Motors Corporation. Position control system. 4,310,172, Cl. 280-703.000.
Claycomb, Brian C.: *See—*
Garrison, Joe K.; and Claycomb, Brian C., 4,309,796, Cl. 19-98.000.
Cleare, Peter J. V.: *See—*
Costain, Winston; Terry, Bernard W. H.; Punja, Nazim; and Cleare, Peter J. V., 4,310,464, Cl. 260-343.600.
Cleaveland, Norman. Circular jig. 4,310,413, Cl. 209-456.000.
Clifton, Robert D.; and Phares, Richard F., to International Business Machines Corporation. Method and apparatus for assigning data sets to virtual volumes in a mass store. 4,310,883, Cl. 364-200.000.
Co-Gen, Inc.: *See—*
Tawse, Ian S., 4,309,877, Cl. 62-238.100.
Coca-Cola Company, The: *See—*
Tracy, Gene A., 4,310,025, Cl. 137-625.480.
Cochran, John M.: *See—*
Phillips, Samuel B., Jr.; and Cochran, John M., 4,310,060, Cl. 177-70.000.
Coen Company, Inc.: *See—*
Binasik, Chester S.; and Siegert, Louis D., 4,310,299, Cl. 432-14.000.
Cogbill, Everett C.: *See—*
Hibbitts, Charles H.; Price, Byron F.; Cogbill, Everett C.; Kelly, James G.; and Glass, James E., 4,310,006, Cl. 131-290.000.
Cohen, Aaron Y.: *See—*
Trubiano, Paolo C.; and Cohen, Aaron Y., 4,310,356, Cl. 106-25.000.
Cohen, Patrice. Pillow-display case. 4,309,784, Cl. 5-442.000.
Cohen, William, to Givat Chaim-Ichud. Fluid distributor system. 4,310,022, Cl. 137-624.180.
Cole, Charles J.: *See—*
Yates, Samuel L.; Cole, Charles J.; Wiesner, Albert H.; and Wagner, John W., 4,310,659, Cl. 528-323.000.
Colgate Palmolive Company: *See—*
Joshi, David P., 4,310,431, Cl. 252-91.000.
Colley, Rowan H., to Rolls-Royce Limited. Constant speed drive. 4,310,768, Cl. 290-1.00C.
Collier, David W., to W. B. Combustion, Inc. Plug-in recuperator and method. 4,310,303, Cl. 432-209.000.
Columbia Ribbon & Carbon Mfg. Co., Inc.: *See—*
Scott, Michael A., 4,310,258, Cl. 400-241.100.
Columbus, Richard L., to Eastman Kodak Company. Liquid transport device containing means for delaying capillary flow. 4,310,399, Cl. 204-195.00R.
Combe Incorporated: *See—*
Holland, David O., 4,310,329, Cl. 8-404.000.
Comben, Richard H., to Medtronic, Inc. Connector assembly for body implantable medical systems. 4,310,001, Cl. 128-419.00P.
Combustion Engineering, Inc.: *See—*
Malki, Khaldoun W.; and Angelini, Edward J., 4,310,498, Cl. 423-242.000.
Zielinski, Edward A., 4,309,948, Cl. 110-263.000.
Commissariat a l'Energie Atomique: *See—*
Guilloteau, Rene; and Segui, Jacques, 4,310,034, Cl. 141-98.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Decrulle, Andre, 4,310,304, Cl. 432-230.000.
Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme): *See—*
Lazzari, Jean-Pierre, 4,310,897, Cl. 365-1.000.
Compeau, Edward E.: *See—*
Winnale, James A.; Rogers, Lloyd W., Jr.; Compeau, Edward E.; and Billis, Albert E., 4,310,179, Cl. 280-803.000.
Comsip Entreprise: *See—*
Richaud, Louis, 4,310,877, Cl. 364-159.000.
Condon, Charles E., Jr.; Johnston, Dean E.; and Shattuck, Charles W., to Torrington Company, The. Thrust washer retaining band. 4,310,205, Cl. 308-135.000.
Connell, G. A. Neville; and Johnson, Richard I., to Xerox Corporation. Method and apparatus for pretreating and depositing thin films on substrates. 4,310,614, Cl. 430-271.000.
Connin, John L., to Eastman Kodak Company. Copy sheet alignment for flash-on-the-fly copiers. 4,310,236, Cl. 355-14.0SH.
Connor, Marc A. Auto body repair tool. 4,309,894, Cl. 72-457.000.
Conrad, Lawrence H., to Minnesota Mining & Manufacturing Company. 6 Mm Ultra-fiche lens. 4,310,223, Cl. 350-465.000.
Consolidated Papers, Inc.: *See—*
Damrau, Wayne A., 4,310,573, Cl. 427-356.000.
Continental Group, Inc., The: *See—*
Walter, John, 4,310,102, Cl. 220-288.000.
Convers, Alain: *See—*
Torck, Bernard; Convers, Alain; Asselineau, Lionel; and Hellin, Michel, 4,310,710, Cl. 568-697.000.
Cook, Jeffrey A.: *See—*
Vallance, James K.; and Cook, Jeffrey A., 4,309,972, Cl. 123-559.000.
Cooke, Robert S.: *See—*
Lazarus, Stanley D.; Cooke, Robert S.; and Galick, Paul E., 4,310,658, Cl. 528-309.000.
Cooke, Thomas W., to Ciba-Geigy Corporation. Fluorochemical nonionic surfactants. 4,310,698, Cl. 568-46.000.
Cooper, Scott A.; Shetty, Ramakrishna; and Pinsky, Jules, to Mearl Corporation, The. Multilayer light-reflecting film. 4,310,584, Cl. 428-212.000.
Coran, Aubert Y.; and Patel, Raman, to Monsanto Company. Nylon modified acrylic copolymer rubber. 4,310,638, Cl. 525-183.000.
Corda, Giuseppe: *See—*
Daniele, Vincenzo; Corda, Giuseppe; Ravaglia, Andrea; and Ferla, Giuseppe, 4,310,571, Cl. 427-102.000.
Cornelius Company, The: *See—*
Tracy, Gene A., 4,310,025, Cl. 137-625.480.
Corning Glass Works: *See—*
Beall, George H.; and Pierson, Joseph E., 4,310,595, Cl. 428-332.000.
Blankenship, Michael G., 4,310,339, Cl. 65-3.120.
Grossman, David G., 4,310,311, Cl. 433-199.000.
Sarkar, Arnab, 4,310,340, Cl. 65-3.120.
Shay, George C., 4,310,607, Cl. 429-104.000.
Corno, Maria L.: *See—*
Doria, Gianfederico; Romeo, Ciriaco; Sberze, Piero; Tibolla, Marcellino; and Corno, Maria L., 4,310,526, Cl. 424-248.550.
Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Sberze, Piero; and Tibolla, Marcellino, 4,310,589, Cl. 424-263.000.
Cornwell, Charles E.; and Plunguian, Mark. Compositions of cementitious mortar, grout and concrete. 4,310,486, Cl. 264-309.000.
Cosbey, Robert C.: *See—*
Roberts, F. Alexander; Stiles, William V.; Cosbey, Robert C.; and Duncan, John P., 4,310,884, Cl. 364-578.000.
Costain, Winston; Terry, Bernard W. H.; Punja, Nazim; and Cleare, Peter J. V., to Imperial Chemical Industries Limited. Lactones. 4,310,464, Cl. 260-343.600.
Coyle, Francis S. Pencil holder. 4,310,109, Cl. 224-230.000.
CPC International Inc.: *See—*
Reiners, Robert A., 4,310,468, Cl. 260-412.400.
Crabtree, Joe: *See—*
Elmy, Raymond L.; Crabtree, Joe; Stevens, Aaron A.; and Lawrence, Randall K., 4,310,082, Cl. 192-11.000.
Crane Enfield Metals Pty. Limited: *See—*
Judd, Douglas K., 4,309,887, Cl. 72-280.000.
Crawford, William H., Jr.: *See—*
Key, Morris D.; and Crawford, William H., Jr., 4,310,425, Cl. 252-8.50A.
Crea, Roberto, to Genentech, Inc. Nucleosidic phosphorylating agent and methods. 4,310,662, Cl. 536-27.000.
Crivello, James V., to General Electric Company. Diaryliodonium salts. 4,310,469, Cl. 260-446.000.
Crosnier, Jean J.: *See—*
de Mendez, Ossona; and Crosnier, Jean J., 4,310,217, Cl. 350-96.160.
Cross Company, The: *See—*
Kraus, Siegfried, 4,310,270, Cl. 408-234.000.
Mottershead, Frank R.; Konkal, John J.; and Gerlach, Charles G., 4,309,925, Cl. 82-12.000.
Cross, Virginia R., to American Hoechst Corp. Polyester film having abrasion resistant radiation curable silicone coating. 4,310,600, Cl. 428-447.000.
Cross, William E.; and Nestor, Charles R., to General Motors Corporation. Female terminal. 4,310,719, Cl. 174-94.00R.
Crown Zellerbach Corporation: *See—*
Dauber, Rikhard C., 4,310,485, Cl. 264-288.400.
Fujii, John S.; Whalley, William G.; and Schmidt, Fred L., 4,310,383, Cl. 162-37.000.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Babini, Giancarlo; Fabbri, Bruno; and Lucchini, Paolo, 4,310,830, Cl. 340-347.0AD.
Culhane, Danny F.: *See—*
Culhane, Vernon C.; and Culhane, Danny F., 4,310,119, Cl. 233-1.00R.
Culhane, Vernon C.; and Culhane, Danny F. Honey extractor. 4,310,119, Cl. 233-1.00R.
Cummins, Earl W., to Du Pont de Nemours, E. I., and Company. Preparation of the calcium salt of α-hydroxy-gamma-methylmercaptobutyric acid. 4,310,690, Cl. 562-581.000.

Cundall, Robert L.; and Walker, Derek, to Bristol-Myers Company. Process for producing carbamoyl substituted penams and carbamoyl substituted cephams from penicillin sulfoxide esters. 4,310,459, Cl. 260-239.100.

Currie, Thomas P., to Sperry Corporation. Reworkable multi-layer printed circuit board. 4,310,811, Cl. 333-1.000.

Currie, William E., to Parker-Hannifin Corporation. Crimping machine. 4,309,892, Cl. 72-402.000.

Curzons, Philip B., to Interox Chemicals Limited. Oxidation of sulfur dyes. 4,310,332, Cl. 8-652.000.

Cutler, Scott E.; Eichelberger, Charles W.; and Haase, Michael A., to General Electric Company. Method of interfacing remote units to a central microprocessor. 4,310,896, Cl. 364-900.000.

Cuv "Progress": *See*—
D'Angiolillo; Karmakov, Encho Y.; Shakrachki, Kiril T.; Shakrachki, Metodi T.; Stoyanov, Stoyan H.; Vassileva, Todorka N.; and Trifonov, Todor P., 4,310,254, Cl. 400-109.000.

Czerwinski, Andrzej: *See*—
Mark, Harry B., Jr.; Czerwinski, Andrzej; and Caja, Josip, 4,310,400, Cl. 204-195.00M.

D'Agostino, Gerald M.: *See*—
Radichio, Arthur, 4,309,875, Cl. 62-66.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Arai, Eisuke; Takagi, Fumio; Ishii, Yasuaki; and Kamei, Kuniaki, 4,310,370, Cl. 156-220.000.
Imamoto, Tsunehiko, 4,310,844, Cl. 346-1.100.

Dai Nippon Printing Co., Ltd.: *See*—
Kubota, Michio; Tsuda, Takeshi; Shimose, Masahiro; Takagi, Kazuhiro; Imamura, Yasuo; and Kato, Kazunori, 4,309,886, Cl. 72-202.000.

Daimler-Benz Aktiengesellschaft: *See*—
Bernauer, Otto; Baier, Horst; and Buchner, Helmut, 4,310,601, Cl. 428-566.000.
Peter, Wolfgang; and Hanke, Hans, 4,310,321, Cl. 474-14.000.
Sorsche, Joachim H.; Ableitner, Erich; Gobien, Ernst; and Minning, Manfred, 4,309,970, Cl. 123-198.00D.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Sakamoto, Seiya; Saito, Isao; Hirosawa, Makoto; and Hohki, Tetsuo, 4,310,234, Cl. 354-298.000.

D'Amato, Dominic A.: *See*—
Scharer, Hans R.; D'Amato, Dominic A.; Hold, Peter; and Hubner, Manfred, 4,310,251, Cl. 366-77.000.

Damrau, Wayne A., to Consolidated Papers, Inc. Method and apparatus for supplying coating to a coater. 4,310,573, Cl. 427-356.000.

Dana Corporation: *See*—
Beck, James P., 4,310,322, Cl. 474-19.000.

D'Angiolillo; Karmakov, Encho Y.; Shakrachki, Kiril T.; Shakrachki, Metodi T.; Stoyanov, Stoyan H.; Vassileva, Todorka N.; and Trifonov, Todor P., to Cuv "Progress". Keyboard device for processing linguistic information. 4,310,254, Cl. 400-109.000.

D'Angiolillo, Louis. Tire pressure monitoring system. 4,310,826, Cl. 340-58.000.

Daniele, Vincenzo; Corda, Giuseppe; Ravaglia, Andrea; and Ferla, Giuseppe, to SGS ATES, Componenti Elettronici S.p.A. Process for producing a calibrated resistance element. 4,310,571, Cl. 427-102.000.

Dante, Mark F., to Shell Oil Company. Stable epoxy-amine curing agent adducts. 4,310,695, Cl. 564-445.000.

Dantlgraber, Jorg; Gossl, Dietmar; and Kramer, Horst, to G. L. Rexroth GmbH. Radial piston pump. 4,310,290, Cl. 417-273.000.

Dasi Industries, Inc.: *See*—
Nahra, John E.; and Woods, Walter, 4,310,476, Cl. 261-118.000.

Da Silva, Artur F., Jr., to U.S. Philips Corporation. Citrus press. 4,309,942, Cl. 99-501.000.

Datalogic S.p.A.: *See*—
Stanzani, Giuseppe, 4,310,836, Cl. 340-556.000.

Date, Haruyuki: *See*—
Azuma, Tomisaburo; Murakami, Takeru; and Date, Haruyuki, 4,310,358, Cl. 106-97.000.

Dauber, Rikhard C., to Crown Zellerbach Corporation. Method of improving the flatness of compression-rolled plastic film. 4,310,485, Cl. 264-288.400.

Daughtry, Arthur C., to Exxon Production Research Company. Pipeline connection system. 4,310,263, Cl. 405-169.000.

David Clark Company Incorporated: *See*—
Stearns, William J.; and Lison, George C., 4,310,732, Cl. 179-156.00A.

Davila, Jose E.: *See*—
Gomez, Jim H.; and Davila, Jose E., 4,310,749, Cl. 235-29.00R.

Davis, Clinton. Safety trench box. 4,310,267, Cl. 405-283.000.

Davis, Dean E., to Clark Equipment Company. Fluid line coupling for fluid actuated extensible structure. 4,310,072, Cl. 187-9.00R.

Davis, Edwin W., to Eastern Company, The. Paddle lock with guard-protected handle disconnect member. 4,309,884, Cl. 70-472.000.

Davis, John K., to Gentex Corporation. Ophthalmic lens series. 4,310,225, Cl. 351-176.000.

Davison, Thomas W.; and Suzuki, Fred K., to Liquid Crystal Products, Inc. Liquid crystal film laminate. 4,310,577, Cl. 428-1.000.

Deadmore, Daniel L.; and Young, Stanley G., to United States of America, National Aeronautics and Space Administration. Method of protecting a surface with a silicon-slurry/aluminide coating. 4,310,574, Cl. 427-405.000.

Dean, Weibley J.; Holmes, Robert H.; and Ragard, Phillip A., to Universal Instruments Corporation. Lead cut and outward clinch mechanism. 4,309,808, Cl. 29-566.300.

DeBloois, Roger C., to United States of America, Army. High power attenuator and termination having a plurality of cascaded tee sections. 4,310,812, Cl. 333-81.00A.

DeBona, Bruce T.; and Prevorsek, Dusan C., to Allied Chemical Corporation. Melt processable poly(ester carbonate) with high glass transition temperature. 4,310,652, Cl. 528-125.000.

DeBona, Bruce T.: *See*—
Reimschuessel, Herbert K.; and DeBona, Bruce T., 4,310,655, Cl. 528-176.000.

De Busscher, Cyriel R. J.; and Van Herpe, Francois, to Sperry Corporation. Combine harvester rethresher. 4,310,004, Cl. 130-27.00F.

De Busscher, Cyriel R. J.; De Coene, Frans J. G. C.; and Van Herpe, Francois, to Sperry Corporation. Combine harvester. 4,310,005, Cl. 130-27.00P.

De Coene, Frans J. G. C.: *See*—
De Busscher, Cyriel R. J.; De Coene, Frans J. G. C.; and Van Herpe, Francois, 4,310,005, Cl. 130-27.00P.

DeCristofaro, Nicholas J., to Allied Corporation. Method for improving magnetic properties of metallic glass ribbon. 4,310,381, Cl. 156-664.000.

Decrulle, Andre, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Installation for assembling electronic components. 4,310,304, Cl. 432-230.000.

DeFife, James R.: *See*—
Ernest, Gerald W.; and DeFife, James R., 4,310,451, Cl. 260-34.200.

De Geest, Wilfried F.; Verkinderen, Paul A.; and De Smedt, Felix F., to AGFA-Gevaert N.V. Apparatus for corona free pinning of extruded polymer film. 4,310,294, Cl. 425-174.80E.

DEGUSSA: *See*—
Achenbach, Karl; and Turk, Gunter, 4,310,496, Cl. 423-118.000.

de Lellis, Joseph, Jr.: *See*—
Manley, Harold J.; and de Lellis, Joseph, Jr., 4,310,721, Cl. 179-1.0SA.

Demaire, Georges; Lys, Jacques; and Berger, Michel, to Societe d'Etudes et de Recherches en Sources d'Energie Nouvelles (SERSEN). Method for desalination of water, in particular sea water. 4,310,396, Cl. 204-151.000.

DeMarco, Alexander H. Wrist brace. 4,309,991, Cl. 128-165.000.

de Mendez, Ossona; and Crosnier, Jean J., to Souriau & Cie. Active coupler between an optical bus line and one of the subscribers and bus line comprising such active couplers. 4,310,217, Cl. 350-96.160.

Demoute, Jean-Pierre: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,310,542, Cl. 424-304.000.

Dennis, Edmund G.; and Dillon, Oscar W., to Cashin Systems Corporation. Continuous cold cut slicing machine. 4,309,927, Cl. 83-77.000.

Derfler, Sara; Tamir, Yehuday; and Wagner, Daniel B., to Ames-Yissum Ltd. Dry radioimmunoassay test composition containing stabilized label/antibody mixture. 4,310,504, Cl. 424-1.000.

Deschamps, Andre; Dezael, Claude; Franckowiak, Sigismond; and Gruhier, Henri, to Institut Francais du Petrole. Process for purifying a hydrogen sulfide containing gas. 4,310,497, Cl. 423-230.000.

De Smedt, Felix F.: *See*—
De Geest, Wilfried F.; Verkinderen, Paul A.; and De Smedt, Felix F., 4,310,294, Cl. 425-174.80E.

DeSoto, Inc.: *See*—
Krajewski, John J.; and Murphy, Edward J., 4,310,653, Cl. 528-143.000.

Destree, Allen. Hydraulic power supply vehicle for concrete cutting and boring tools. 4,310,198, Cl. 299-39.000.

Determan, Roger G., to Gresen Manufacturing Company. Electrically controlled proportional valve. 4,310,143, Cl. 251-30.000.

Deters, Elmer M., to Marley-Wylain Company, The. Liquid dispensing and uphill vapor recovery system. 4,310,033, Cl. 141-44.000.

Dewitt, Elmer J., to B. F. Goodrich Company, The. High impact compositions containing polycyano norbornenes. 4,310,637, Cl. 525-75.000.

Dexter, James T., to Under Sea Industries, Inc. Scuba tank harness. 4,310,110, Cl. 224-246.000.

Dextrous Engineering & Sales Corp.: *See*—
Normandin, Marcel H., 4,310,032, Cl. 140-82.000.

Dezael, Claude: *See*—
Deschamps, Andre; Dezael, Claude; Franckowiak, Sigismond; and Gruhier, Henri, 4,310,497, Cl. 423-230.000.

Diamond, Allen M.: *See*—
Brown, James R.; and Diamond, Allen M., 4,310,243, Cl. 356-300.000.

Diamond Shamrock Corporation: *See*—
Gullo, James M.; Heilman, William P.; Wayner, Robert J.; and Moser, Robert E., 4,310,551, Cl. 424-249.000.

Diamond Shamrock Plastics Corporation: *See*—
Ernest, Gerald W.; and DeFife, James R., 4,310,451, Cl. 260-34.200.

Dick, Nancy J.: *See*—
Wang, Ching C.; and Dick, Nancy J., 4,310,541, Cl. 424-304.000.

Diedrich, Heinz K.: *See*—
Fazi, Marco; and Diedrich, Heinz K., 4,310,761, Cl. 250-342.000.

Dil, Jan G., to U.S. Philips Corporation. Optical record carrier and apparatus for reading it. 4,310,916, Cl. 369-109.000.

Dillon, Oscar W.: *See*—
Dennis, Edmund G.; and Dillon, Oscar W., 4,309,927, Cl. 83-77.000.

Dirks, Albertus G.: *See*—
Biesterbos, Johannes W. M.; and Dirks, Albertus G., 4,310,899, Cl. 365-113.000.

Dirksen, Larry E. Portable boom structure. 4,310,098, Cl. 212-187.000.

Discovision Associates: *See—*
Slaten, Gary G., 4,310,919, Cl. 369-275.000.
Disko, Harry: *See—*
Kulesza, Ralph J.; and Disko, Harry, 4,309,840, Cl. 46-68.000.
Dixico Incorporated: *See—*
Miller, William P.; and Twigg, Robert W., 4,310,369, Cl. 156-218.000.
Dobfar S.p.A.: *See—*
Falciani, Marco; and Broggi, Renato, 4,310,460, Cl. 260-239.100.
Dobson, Charles E. Plate mounting clip. 4,310,135, Cl. 248-221.400.
Dodak, Michael J.; and Whitlock, Charles R. Microbicidal filter. 4,309,992, Cl. 128-213.00A.
Dodin, Mark G.; and Charkey, Allen, to Energy Research Corporation. Separator incorporating liquid layer. 4,310,608, Cl. 429-131.000.
Dohren, Hans: *See—*
Schmidt, Volkmar; Lieder, Bernhard; Scheve, Heinrich; and Dohren, Hans, 4,310,333, Cl. 48-77.000.
Dolak, Lester A.; Laborde, Alice L.; and Castle, Thomas M., to Upjohn Company, The. Process of producing 3-trehalosamine by fermentation. 4,310,627, Cl. 435-84.000.
Donald, Jack W. Contraceptive and/or antivenereal disease tampon. 4,309,997, Cl. 128-270.000.
Donald MacMillan & Son, Inc.: *See—*
MacMillan, Kenneth T., 4,310,374, Cl. 156-394.0FM.
Donovan, William F., to United States of America, Army. High pressure lip seal. 4,310,162, Cl. 277-103.000.
Doorakian, George A.: *See—*
Strege, Paul E.; and Doorakian, George A., 4,310,708, Cl. 568-648.000.
Dorawala, Tansukhlal G.; Reinhard, Russell R.; and Kerr, Edwin R., to Texaco, Inc. Steam dealkylation process. 4,310,715, Cl. 585-487.000.
Dorbeck, Leo R., to Canadian Sun Systems Ltd. Solar energy collection system. 4,309,984, Cl. 126-422.000.
Dorfel, Werner H.; Medinger, Bernhard; and Troxler, Eduard, to Ciba-Geigy Corporation. Thermal tumbling granulation. 4,310,483, Cl. 264-117.000.
Doria, Gianfederico; Romeo, Ciriaco; Sberze, Piero; Tibolla, Marcellino; and Corno, Maria L., to Farmitalia Carlo Erba S.p.A. Substituted 6,7-methylene pyrido[1,2-a]pyrimidines useful as anti-allergic and anti-ulcer agents. 4,310,526, Cl. 424-248.550.
Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Sberze, Piero; and Tibolla, Marcellino, to Farmitalia Carlo Erba S.p.A. 2-(Pyridylcyclopropyl)chromones. 4,310,589, Cl. 424-263.000.
Dorries, Peter; and Keil, Karl-Heinz, to Cassella Aktiengesellschaft. Internal release agent for thermosetting aminoplast resins. 4,310,355, Cl. 106-2.000.
Doster, Robert C.; and Nelson, Sharon L., to Carnation Company. Method of producing a porous, pelletized food product. 4,310,560, Cl. 426-285.000.
Dovichi, Norman J.: *See—*
Harris, Joel M.; and Dovichi, Norman J., 4,310,762, Cl. 250-343.000.
Dow Chemical Co., The: *See—*
Frenier, Wayne W., 4,310,435, Cl. 252-180.000.
Gross, James R., 4,310,593, Cl. 428-290.000.
Mendoza, Abel, 4,310,688, Cl. 560-222.000.
Shipley, Randall S.; and Lowery, Kirby, Jr., 4,310,648, Cl. 526-114.000.
Strege, Paul E., 4,310,706, Cl. 568-648.000.
Strege, Paul E., 4,310,707, Cl. 568-648.000.
Strege, Paul E.; and Doorakian, George A., 4,310,708, Cl. 568-648.000.
Zacharias, George, 4,310,647, Cl. 525-530.000.
Dow Corning Corporation: *See—*
Baney, Ronald H., 4,310,481, Cl. 264-65.000.
Baney, Ronald H., 4,310,482, Cl. 264-65.000.
Baney, Ronald H.; and Gaul, John H., 4,310,651, Cl. 528-21.000.
Blizzard, John D.; and Swihart, Terence J., 4,310,678, Cl. 556-451.000.
Drake, Miles P., to International Standard Electric Corporation. Porous metal films. 4,309,810, Cl. 29-570.000.
Dresser Industries, Inc.: *See—*
Wetterhorn, Richard H.; and Busch, David A., 4,310,133, Cl. 248-27.100.
DuBois, Chester G., to Outboard Marine Corporation. Fuel primer and enrichment system for an internal combustion engine. 4,309,968, Cl. 123-187.50R.
Duchstein, Siegfried. Casting perlite before the swine. 4,310,552, Cl. 426-2.000.
Dudek, Matthew. Expandable tube plug. 4,310,029, Cl. 138-89.000.
Dudley, Robert H.; Areaux, Larry D.; and Dudley, Russell D., to Reclamet, Inc. Air inlet material separator for chip centrifuge. 4,310,417, Cl. 210-375.000.
Dudley, Russell D.: *See—*
Dudley, Robert H.; Areaux, Larry D.; and Dudley, Russell D., 4,310,417, Cl. 210-375.000.
Duga, Robert J.: *See—*
Spurr, Robert; and Duga, Robert J., 4,310,282, Cl. 414-753.000.
Dumont, Alain G., to Jeumont-Schneider. Ringing device for a private automatic branch exchange. 4,310,728, Cl. 179-18.0HB.
Duncan, John P.: *See—*
Roberts, F. Alexander; Stiles, William V.; Cosbey, Robert C.; and Duncan, John P., 4,310,884, Cl. 364-578.000.
Dunlop Limited: *See—*
Gaydecki, Jan, 4,310,579, Cl. 428-105.000.
Du Pont de Nemours, E. I., and Company: *See—*
Adams, Charles D., 4,310,470, Cl. 260-453.700.
Cummins, Earl W., 4,310,690, Cl. 562-581.000.
Heyer, David E., 4,310,295, Cl. 425-224.000.
Lee, Chi C.; and Ludwig, Richard E., 4,310,591, Cl. 428-283.000.
Levitt, George; and Sauers, Richard F., 4,310,346, Cl. 71-92.000.
Smeltz, Kenneth C., 4,310,426, Cl. 252-8.800.
Van Buskirk, Oral R., 4,310,596, Cl. 428-336.000.
Durette, Philippe L., to Merck & Co., Inc. Immunologically active dipeptidyl 5-0,6-0-acyl-2-amino-2-deoxy-D-glucofuranose derivatives and methods of preparation. 4,310,514, Cl. 424-88.000.
Duys, Andreas M. W., to U.S. Philips Corporation. Cathode-ray tube. 4,310,776, Cl. 313-414.000.
Dynamic Compliance, Incorporated: *See—*
Carlsen, George D., II, 4,310,731, Cl. 179-110.00F.
Dynamit Nobel AG: *See—*
Kotzsch, Hans-Joachim; Amort, Jurgen; and Vahlensieck, Hans-Joachim, 4,310,680, Cl. 556-467.000.
E. R. Squibb & Sons, Inc.: *See—*
Krapcho, John; and Wade, Peter C., 4,310,461, Cl. 260-326.200.
Eagle-Picher Industries, Inc.: *See—*
Mackenzie, 4,310,300, Cl. 432-18.000.
Early, Jack; Kaufman, Arthur; and Stawsky, Alfred, to Engelhard Minerals & Chemicals Corp. Fuel cell system. 4,310,605, Cl. 429-18.000.
Easter, William M.: *See—*
Larsen, Gregory J.; and Easter, William M., 4,309,943, Cl. 99-509.000.
Eastern Company, The: *See—*
Davis, Edwin W., 4,309,884, Cl. 70-472.000.
Eastern Metal of Elmira, Inc.: *See—*
Knapp, Michael, 4,309,836, Cl. 40-602.000.
Eastman, Alan D.; and Kolts, John H., to Phillips Petroleum Company. Oxidative dehydrogenation and catalyst. 4,310,717, Cl. 585-661.000.
Eastman, George Y.; Ernst, Donald M.; and Thomas, Warren E., to Thermacore, Inc. Solar heater. 4,309,986, Cl. 126-433.000.
Eastman Kodak Company: *See—*
Columbus, Richard L., 4,310,399, Cl. 204-195.00R.
Connin, John L., 4,310,236, Cl. 355-14.0SH.
Fernandez, Jose M.; and Pepe, Joseph P., 4,310,618, Cl. 430-381.000.
Gengelbach, Robert D., 4,310,237, Cl. 355-14.00E.
Hagemeyer, Hugh J., Jr.; and Edwards, Marvin B., 4,310,639, Cl. 525-247.000.
Luckey, George W., 4,310,507, Cl. 424-4.000.
Miskinis, Edward T., 4,310,611, Cl. 430-107.000.
Mooberry, Jared B.; and Archie, William C., Jr., 4,310,612, Cl. 430-223.000.
Suggs, James L.; Buck, Dan F.; and Hobbs, Howard K., 4,310,556, Cl. 426-96.000.
Suggs, James L.; Buck, Dan F.; and Hobbs, Howard K., 4,310,557, Cl. 426-96.000.
Eaton Corporation: *See—*
Calviello, Joseph A., 4,310,570, Cl. 427-89.000.
Hoppie, Lyle O., 4,310,079, Cl. 192-4.00A.
Eberle, William J.; and Mills, Robert J., III, to General Battery Corporation. Stacker with improved hydraulic cylinder movement. 4,309,936, Cl. 91-405.000.
Eberle, William J., to General Battery Corporation. Apparatus for dumping and collecting corrosive substances from automotive batteries. 4,310,280, Cl. 414-415.000.
Ebina, Ryuzo; Nakayama, Tsutomu; and Tanaka, Minoru, to Mitsubishi Kasei Kogyo Kabushiki Kaisha. Welding apparatus. 4,310,376, Cl. 156-499.000.
Ebo-Jager, Inc.: *See—*
Jager, Wolfgang, 4,310,822, Cl. 337-53.000.
Edelstein, William A.: *See—*
Hutchison, James M. S.; Sutherland, Robert J.; Edelstein, William A.; and Mallard, John R., 4,310,799, Cl. 324-319.000.
Edge, Michael D., to Imperial Chemical Industries Limited. Hydroxyacetic acid derivatives with anti-arthritic properties. 4,310,544, Cl. 424-308.000.
Edison Price, Incorporated: *See—*
Price, Edison A., 4,310,875, Cl. 362-277.000.
Edner, Stig F.: *See—*
Bondeson, Leif S.; and Edner, Stig F., 4,310,089, Cl. 198-530.000.
Edstrom, Gene H.; and Paulsen, Paul H., to International Business Machines Corporation. Plural null digital interconnections. 4,310,895, Cl. 364-900.000.
Edwards, John A., to Syntex (U.S.A.) Inc. Thio etianic acid derivatives. 4,310,466, Cl. 260-397.100.
Edwards, Louis L., Jr.: *See—*
Meredith, Michael D.; Edwards, Louis L., Jr.; and Van Scotter, Keith T., 4,310,384, Cl. 162-60.000.
Edwards, Marvin B.: *See—*
Hagemeyer, Hugh J., Jr.; and Edwards, Marvin B., 4,310,639, Cl. 525-247.000.
Egashira, Hiroji. Pipe nesting and denesting apparatus. 4,310,281, Cl. 414-433.000.
Egawa, Mitsuo: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; Fukami, Harukazu; Egawa, Mitsuo; and Ninomiya, Kunihiro, 4,310,534, Cl. 424-267.000.
Eggleton, Richard C. Apparatus for moulding concrete. 4,310,293, Cl. 425-62.000.

Egyt Gyogyszervegyeszeti Gyar: *See—*
Budai, Zoltan; Jurak, Ferenc; Kis-tamas, Attila; Lay nee Konya, Aranka; Mezei, Tibor; Vig, Zoltan; and Zubovits nee Kristof, Terez, 4,310,348, Cl. 71-121.000.

Ehashi, Shigeyuki; Tsuchida, Junichi; Kakimoto, Kenichi; and Katsura, Hiromitsu, to Toyo Ink Manufacturing Co., Ltd. Pigment compositions. 4,310,359, Cl. 106-288.00Q.

Ehrenfreund, Josef, to Ciba-Geigy Corporation. Pesticidal N-tetrafluorophenyl-N'-benzoyl ureas. 4,310,548, Cl. 424-322.000.

Ehrenfreund, Josef, to Ciba-Geigy Corporation. P-(Alkenylamino) phenylamines. 4,310,694, Cl. 564-442.000.

Eichelberger, Charles W.: *See—*
Cutler, Scott E.; Eichelberger, Charles W.; and Haase, Michael A., 4,310,896, Cl. 364-900.000.

Eicher, Josef, to Cabo AG. Transport apparatus especially for goods, capable of travelling over stairs. 4,310,166, Cl. 280-5.280.

Eickmann, Karl. Hydrostatic support assembly. 4,310,203, Cl. 308-9.000.

Eide, Ola: *See—*
Raa, Jan; Strom, Terje; Tidemann, Even; and Eide, Ola, 4,309,794, Cl. 17-46.000.

Ekman, Gunnar O.; and Granlund, Lars A., to Nitro Nobel AB. Emulsion explosive sensitive to a detonator. 4,310,364, Cl. 149-2.000.

Eldumiati, Ismail I., to Bell Telephone Laboratories, Incorporated. Conditional transfer control circuit. 4,310,881, Cl. 364-200.000.

Electric Fuel Propulsion Corp.: *See—*
Lauve, Henry de S., 4,310,872, Cl. 362-82.000.

Electronic Memories & Magnetics Corporation: *See—*
Harding, Phillip A.; Chong, Carlos F.; and Pockell, Herman L., 4,310,901, Cl. 365-200.000.

Elek, Sandor: *See—*
Hajos, Andor; Fekete, Marton; Kurti, Marianna; Lang, Tibor; Toldy, Lajos; Borvendeg, Janos; Nagy, Laszlo; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,310,549, Cl. 424-330.000.

Elekes, Istvan: *See—*
Hajos, Andor; Fekete, Marton; Kurti, Marianna; Lang, Tibor; Toldy, Lajos; Borvendeg, Janos; Nagy, Laszlo; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,310,549, Cl. 424-330.000.

Elettronica San Giorgio ELSAG S.p.A.: *See—*
Castagnoli, Guiseppe, 4,310,276, Cl. 414-134.000.

Elkern, Kenneth E.; and Nielsen, Henning H. Electric fluid heating apparatus. 4,310,746, Cl. 219-326.000.

Elliott, Harold V.: *See—*
Sundeen, Arthur R.; and Elliott, Harold V., 4,310,174, Cl. 280-731.000.

Elliott, William A.; and Taylor, Thomas J., to Western Electric Company, Inc. Methods for the manufacture of multi-conductor flat cable. 4,310,365, Cl. 156-55.000.

Elm, Rainer: *See—*
Vangermain, Erwin; Mengler, Claus-Dieter; Elm, Rainer; Ueberschaer, Horst; and Brauckmann, Wilhelm, 4,310,442, Cl. 252-455.00R.

Elmy, Raymond L.; Crabtree, Joe; Stevens, Aaron A.; and Lawrence, Randall K., to Murray Ohio Manufacturing Co., The. Variable speed drive and combined clutch/brake system. 4,310,082, Cl. 192-11.000.

Emerson Electric Co.: *See—*
Grebe, John C., Jr.; and Freund, William R., Jr., 4,309,909, Cl. 73-861.120.

Emhart Industries, Inc.: *See—*
Spurr, Robert; and Duga, Robert J., 4,310,282, Cl. 414-753.000.

Emi, Shingo: *See—*
Yamazaki, Yasuyuki; Emi, Shingo; Norota, Susumu; Takamatu, Kazuo; and Ono, Tomoyoshi, 4,310,594, Cl. 428-296.000.

Emmons, Larrimore B.: *See—*
Felter, Richard E.; Emmons, Larrimore B.; Eshbach, John R., Jr.; and Posipanko, Thomas, 4,310,581, Cl. 428-109.000.

Emoto, Kazuhiro: *See—*
Iguchi, Shigeru; and Emoto, Kazuhiro, 4,310,613, Cl. 430-251.000.

Energy Research Corporation: *See—*
Dodin, Mark G.; and Charkey, Allen, 4,310,608, Cl. 429-131.000.
Marchetti, Peter G., 4,310,604, Cl. 429-17.000.

Enertec: *See—*
Lelandais, Guy, 4,310,863, Cl. 360-90.000.

Eng, Kjell, to AB Volvo. Coaxial cable for high amperages. 4,310,718, Cl. 174-15.0WF.

Engdahl, Jean, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Sealed electric passages. 4,310,363, Cl. 148-31.500.

Engelhard Minerals & Chemicals Corp.: *See—*
Early, Jack; Kaufman, Arthur; and Stawsky, Alfred, 4,310,605, Cl. 429-18.000.

Erckel, Rudiger; and Rosch, Gunter, to Hoechst Aktiengesellschaft. Novel stilbene compounds and process for the manufacture thereof. 4,310,665, Cl. 542-435.000.

Erickson, Donald C. Hydrogen production by multistaged intermediate oxidation-reduction. 4,310,503, Cl. 423-657.000.

Erickson, John W., to Kobe, Inc. Method and apparatus for improving erosion resistance of the mixing chamber of a jet pump. 4,310,288, Cl. 417-54.000.

Ernest, Gerald W.; and DeFife, James R., to Diamond Shamrock Plastics Corporation. Free flowing rigid PVC resin powder compositions. 4,310,451, Cl. 260-34.200.

Ernest, John B.: *See—*
Kalvinskas, John J.; Hsu, George C.; and Ernest, John B., 4,310,049, Cl. 166-267.000.

Ernst, Donald M.: *See—*
Eastman, George Y.; Ernst, Donald M.; and Thomas, Warren E., 4,309,986, Cl. 126-433.000.

Ernst Leitz Wetzlar GmbH: *See—*
Magel, Rolf, 4,310,229, Cl. 354-43.000.

Erskine, James B., to Imperial Chemical Industries Limited. Acoustically lagged structure. 4,310,068, Cl. 181-290.000.

Ertl, Ludwig: *See—*
Hesselmann, Karlheinz; Tschiers, Bernhard; and Ertl, Ludwig, 4,310,576, Cl. 427-428.000.

Erwin Sick GmbH: *See—*
Sick, Erwin; and Ostertag, Klaus, 4,310,250, Cl. 356-431.000.

Erwin Sick GmbH Optik-Elektronik: *See—*
Sick, Erwin; and Fetzer, Gunter, 4,310,756, Cl. 250-221.000.

Escher Wyss Limited: *See—*
Christ, Alfred; and Annen, Heinz, 4,310,204, Cl. 308-9.000.

Eshbach, John R., Jr.: *See—*
Felter, Richard E.; Emmons, Larrimore B.; Eshbach, John R., Jr.; and Posipanko, Thomas, 4,310,581, Cl. 428-109.000.

Esquire, Inc.: *See—*
Baker, Garland W., 4,310,828, Cl. 340-825.220.

Essler, Richard; and Schedele, Helmut, to Siemens Aktiengesellschaft. Electromagnetic relay with improved fixed contact elements. 4,310,818, Cl. 335-135.000.

Establissements Mesnel: *See—*
Mesnel, Francois, 4,310,164, Cl. 277-189.000.

Etschenberg, Eugen; Opitz, Wolfgang; and Raddatz, Siegfried, to Troponwerke GmbH & Co., KG. Tumor-resolving and histolytic medicaments and their use. 4,310,517, Cl. 424-177.000.

Evans, David G.: *See—*
Chiesa, Alan F.; Evans, David G.; Norford, James R.; and Zahorchak, John A., 4,309,971, Cl. 123-480.000.

Evans, Stephen E.: *See—*
Schumacher, Ernest W.; and Evans, Stephen E., 4,310,338, Cl. 62-470.000.

Eveleens, Willem; Spaans, Johannes; and Wissink, Hendrik G., to Akzo N.V. Process for the preparation of optically active 2-phenoxy propionic acids and herbicidal preparations containing such acids. 4,310,689, Cl. 562-472.000.

EVVA-Werk Spezialerzeugung von Zylinder- und Sicherheitsschlossern Gesellschaft m.b.H. & Co. Kommanditgesellschaft: *See—*
Lanik, Hans, 4,310,820, Cl. 335-284.000.

Exxon Production Research Company: *See—*
Daughtry, Arthur C., 4,310,263, Cl. 405-169.000.

Exxon Research & Engineering Co.: *See—*
Agarwal, Pawan K.; and Makowski, Henry S., deceased, 4,310,457, Cl. 260-235.000.
Bartz, Kenneth W., 4,310,636, Cl. 525-71.000.
Langer, Arthur W., 4,310,439, Cl. 252-429.00B.
Makowski, Henry S., deceased, 4,310,445, Cl. 260-23.50A.
Oswald, Alexis A.; and Mozeleski, Edmund J., 4,310,471, Cl. 260-456.00P.

Ezis, Andre: *See—*
Uy, James C.; and Ezis, Andre, 4,310,477, Cl. 264-62.000.

Fabbri, Bruno: *See—*
Babini, Giancarlo; Fabbri, Bruno; and Lucchini, Paolo, 4,310,830, Cl. 340-347.0AD.

Fabrin, Knud C. C.: *See—*
Northeved, Allan; and Fabrin, Knud C. C., 4,309,906, Cl. 73-612.000.

Faelchle, Joerg: *See—*
Wanner, Karl; Thome, Ludwig; Faelchle, Joerg; and Lehmann, Werner, 4,310,055, Cl. 173-118.000.

Fahim, Mostafa S., to University of Missouri, The Curators of the. Topical application of medication by ultrasound with coupling agent. 4,309,989, Cl. 128-24.00A.

Fahrbach, Erich: *See—*
Schuhmacher, Gunter; Fahrbach, Erich; and Wagner, Sepp, 4,310,373, Cl. 156-308.200.

Fahrig, Robert J.; and Hinrichs, Lansing M., to Standard Oil Company (Indiana). Apparatus for the catalytic cracking of hydrocarbons. 4,310,489, Cl. 422-110.000.

Faice, Louis R., to Varian Associates, Inc. Dispenser cathode. 4,310,603, Cl. 428-596.000.

Falciani, Marco; and Broggi, Renato, to Dobfar S.p.A. Process for the production of 6-D-α-amino-p-hydroxyphenylacetamido penicillanic acid. 4,310,460, Cl. 260-239.100.

Fancher, Llewellyn W.; and Baker, Don R., to Stauffer Chemical Company. Biocidal isothiourea compounds. 4,310,539, Cl. 424-326.000.

Fantetti, Giuseppe, to I.C.S. Cidneo S.p.A. Toilet seat and cover therefor. 4,309,780, Cl. 4-234.000.

Farmitalia Carlo Erba S.p.A.: *See—*
Doria, Gianfederico; Romeo, Ciriaco; Sberze, Piero; Tibolla, Marcellino; and Corno, Maria L., 4,310,526, Cl. 424-248.550.
Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Sberze, Piero; and Tibolla, Marcellino, 4,310,589, Cl. 424-263.000.

FARO Fabbrica Apparecchiature Razionali Odontoiatriche S.p.A.: *See—*
Favonio, Osvaldo, 4,310,309, Cl. 433-104.000.

Farquharson, Graeme: *See—*
Serban, Alexander; Farquharson, Graeme; Lydiate, Jack; and Bird, Graham J., 4,310,347, Cl. 71-93.000.

Fauke, Allen R.: *See—*
Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,310,472, Cl. 260-465.400.

Fauve, Robert M., to Institut Pasteur. Method of processing an active principle of a hydrophobic medicament and product thereof. 4,310,513, Cl. 424-80.000.
Favonio, Osvaldo, to FARO Fabbrica Apparecchiature Razionali Odontoiatriche S.p.A. Dental bur drill. 4,310,309, Cl. 433-104.000.
Faye, Lloyd H. Hinged bracket assembly for a drain trough. 4,309,792, Cl. 16-389.000.
Fazi, Marco; and Diedrich, Heinz K. Infrared detector device for the exploration of thermal images by systems operating a scanning of the parallel series type with the relative manufacturing process. 4,310,761, Cl. 250-342.000.
Feddern, Uwe: *See*—
Siebeneck, Jurgen; and Feddern, Uwe, 4,310,842, Cl. 343-5.0PD.
Feffer, Philip C., to Chevron Research. Texturizing process. 4,309,801, Cl. 28-248.000.
Fehlisch, Silvan: *See*—
Kolb, Fritz; Ziegert, Otto; and Fehlisch, Silvan, 4,310,069, Cl. 181-296.000.
Fekete, Marton: *See*—
Hajos, Andor; Fekete, Marton; Kurti, Marianna; Lang, Tibor; Toldy, Lajos; Borvendeg, Janos; Nagy, Laszlo; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,310,549, Cl. 424-330.000.
Felter, Richard E.; Emmons, Larrimore B.; Eshbach, John R., Jr.; and Posipanko, Thomas, to Armstrong Cork Company. Surface covering articles. 4,310,581, Cl. 428-109.000.
Ferla, Giuseppe: *See*—
Daniele, Vincenzo; Corda, Giuseppe; Ravaglia, Andrea; and Ferla, Giuseppe, 4,310,571, Cl. 427-102.000.
Fernandez, Jose M.; and Pepe, Joseph P., to Eastman Kodak Company. Silver halide photographic material and process utilizing blocked dye-forming couplers. 4,310,618, Cl. 430-381.000.
Feroda Limited: *See*—
Chester, John, 4,310,452, Cl. 260-38.000.
Ferrus, Serge: *See*—
West, Jon K.; LeDuc, Kenneth; and Ferrus, Serge, 4,310,421, Cl. 210-740.000.
Fetterolf, James R., Sr.; Metzger, Donald L.; Snyder, Clair W., Jr.; and Wise, James H., to AMP Incorporated. Electrical connector kit. 4,310,213, Cl. 339-103.00M.
Fetzer, Gunter: *See*—
Sick, Erwin; and Fetzer, Gunter, 4,310,756, Cl. 250-221.000.
F'Geppert, Erwin, to United States of America, Army. Motor-driven winch having internal speed reducer. 4,310,146, Cl. 254-342.000.
Field, Thomas R.; and VanArsdall, Mary L., to International Business Machines Corporation. Typewriter cartridge lock-down. 4,310,257, Cl. 400-208.000.
Filtrol Corporation: *See*—
Alafandi, Hamid; and Stamires, Dennis, 4,310,441, Cl. 252-453.000.
Findeisen, Kurt; Freimuth, Reinhard; and Wagner, Kuno, to Bayer Aktiengesellschaft. Process for the preparation of alkyl-ureas. 4,310,692, Cl. 564-61.000.
Finke, Ulrich; and Moretto, Hans-Heinrich, to Bayer Aktiengesellschaft. Equilibrating organosiloxanes with fluorine- and sulphonyl-containing catalysts. 4,310,679, Cl. 556-462.000.
Finkenzeller, Joahnn; and Holzermer, Gunter, to Siemens Aktiengesellschaft. Motor driven x-ray grid and film-holder assembly. 4,310,766, Cl. 250-509.000.
Firth, John R.: *See*—
Perkins, Charles V.; and Firth, John R., 4,310,244, Cl. 356-334.000.
Fischer, Charles P.: *See*—
Mitrzyk, Jan C., Sr.; Gossoo, Rodney W.; Fischer, Charles P.; Silvernail, Howard N.; and Null, Charles, 4,309,928, Cl. 83-161.000.
Fischer, Janos. Key for data processing miniature implements. 4,310,753, Cl. 235-145.00R.
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Raa, Jan; Strom, Terje; Tidemann, Even; and Eide, Ola, 4,309,794, Cl. 17-46.000.
Fitzgerald, Charles A., to Fitzgerald Engineering Co., Inc. Back-lit graphic display panel apparatus. 4,310,832, Cl. 340-381.000.
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Fitzgerald, Charles A., 4,310,832, Cl. 340-381.000.
Fitzgerald, Joseph M. Aerodynamic wind deflector for a refrigerated trailer. 4,310,192, Cl. 296-1.00S.
Fives-Cail Babcock: *See*—
Georget, Jean-Pierre, 4,310,361, Cl. 127-5.000.
Flagg, Rodger H. Structure of inflatable tubes with closed loop connectors. 4,309,851, Cl. 52-2.000.
Flamm, Daniel L.; Maydan, Dan; and Wang, David N., to Bell Telephone Laboratories, Incorporated. Plasma etching of silicon. 4,310,380, Cl. 156-643.000.
Flanigen, Edith M.: *See*—
Wilson, Stephen T.; Lok, Brent M.; and Flanigen, Edith M., 4,310,440, Cl. 252-435.000.
Fleming, Mills L.; Fuchs, George L.; Gladden, Robert H., Jr.; and Ross, Robert R., to Western Electric Company, Inc.; and Bell Telephone Laboratories, Inc. Cable shield connecting device. 4,310,209, Cl. 339-14.00R.
Fletcher Sutcliffe Wild Limited: *See*—
Bower, Lewis R.; and Scarfe, Arthur, 4,310,268, Cl. 405-294.000.
Floyd, Middleton B., Jr.: *See*—
Wissner, Allan; and Floyd, Middleton B., Jr., 4,310,700, Cl. 568-330.000.
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Rice, Warren A.; Vinton, Clarence S.; Franklin, Charles H.; and Torbett, Christopher J., 4,310,747, Cl. 219-381.000.
FMC Corporation: *See*—
Frost, Elmer F., Jr.; and Larsen, Gregory J., 4,309,944, Cl. 100-104.000.
Larsen, Gregory J.; and Easter, William M., 4,309,943, Cl. 99-509.000.
Fochler, Helmut P.: *See*—
Pate, Harold T.; and Fochler, Helmut P., 4,309,855, Cl. 52-169.500.
Foley, James W.; Locatell, Louis, Jr.; and Zepp, Charles M., to Polaroid Corporation. Xanthene compounds. 4,310,673, Cl. 548-207.000.
Fombellida, Miguel, to Northern Telecom Limited. Laying and binding optical waveguides onto a support filament. 4,309,866, Cl. 57-15.000.
Fontlladosa, Enrique B. Display unit for displaying confectionary items having sticks. 4,310,095, Cl. 211-60.00A.
Ford Motor Company: *See*—
Bains, William R., 4,309,933, Cl. 89-9.000.
Springer, Jerry L.; and Wells, Charles M., 4,309,897, Cl. 73-23.000.
Uy, James C.; and Ezis, Andre, 4,310,477, Cl. 264-62.000.
Vallance, James K.; and Cook, Jeffrey A., 4,309,972, Cl. 123-559.000.
Forrest, William J. Animal handling apparatus. 4,309,963, Cl. 119-96.000.
Foster, Edson P., to Foster Needle Co. Felting needle. 4,309,800, Cl. 28-115.000.
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Foster, Edson P., 4,309,800, Cl. 28-115.000.
Fountain, Richard W.; Boesch, William J.; and Reichman, Steven H., to Special Metals Corporation. Process for producing a shape memory effect alloy having a desired transition temperature. 4,310,354, Cl. 75-211.000.
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Olsen, Everett O., 4,310,841, Cl. 340-870.430.
Fraga, John B. Fail-safe slide fastener. 4,309,798, Cl. 24-205.00R.
Frajdenrajch, Jacob. Mechanical device for holding elastic articles. 4,310,305, Cl. 433-4.000.
Frances, Andre L. Spiralled printed inductance. 4,310,821, Cl. 336-200.000.
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Frank, Daniel G.; Schaefer, Jack; and Zweig, Richard L., to Therapeople, Inc. Tactile learning device for the handicapped. 4,310,315, Cl. 434-114.000.
Frank, Fred R., to Upjohn Company, The. Chicken feed composition. 4,310,522, Cl. 424-236.000.
Frank, Karl: *See*—
Odenwalder, Heinrich; Frank, Karl; and Muller, Reinhard, 4,310,621, Cl. 430-443.000.
Frank, Pierre: *See*—
Arsac, Aime J.; and Frank, Pierre, 4,310,331, Cl. 8-527.000.
Franklin, Charles H.: *See*—
Rice, Warren A.; Vinton, Clarence S.; Franklin, Charles H.; and Torbett, Christopher J., 4,310,747, Cl. 219-381.000.
Franklin, Paul F., to Meistergram Inc. Embroidery machine. 4,309,950, Cl. 112-103.000.
Frantz, Gene A.: *See*—
Henderson, Alva E.; and Frantz, Gene A., 4,310,831, Cl. 340-347.00M.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef; and Riessberger, Klaus, 4,309,846, Cl. 51-5.00B.
Freed, Donald L., Jr.; and Baum, Gerald L., to National Mine Service Company. Cutter drum assembly for a continuous mining machine. 4,310,199, Cl. 299-76.000.
Freidinger, Roger M.; and Veber, Daniel F., to Merck & Co., Inc. Cyclic hexapeptide somatostatin analogs. 4,310,518, Cl. 424-177.000.
Freimuth, Reinhard: *See*—
Findeisen, Kurt; Freimuth, Reinhard; and Wagner, Kuno, 4,310,692, Cl. 564-61.000.
Freitag, Herbert, to Stabilus GmbH. Cylinder-and-piston device. 4,310,148, Cl. 267-124.000.
Fremerey, Johan K., to Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung. Circuit measuring average period of periodic signal. 4,310,795, Cl. 324-78.00D.
Fremont, Henry A.; Obenour, Mary C.; and Hedrick, Edward F., to Champion International Corporation. Apparatus and method for removing suspended solids from a stream. 4,310,424, Cl. 210-791.000.
Frenier, Wayne W., to Dow Chemical Co., The. Method and composition for removing sulfide-containing scale from metal surfaces. 4,310,435, Cl. 252-180.000.
Freund Industrial Co., Ltd.: *See*—
Motoyama, Shimesu; Yamada, Shuri; Kurita, Kaoru; and Iwasaki, Akira, 4,310,108, Cl. 222-396.000.
Freund, William R., Jr.: *See*—
Grebe, John C., Jr.; and Freund, William R., Jr., 4,309,909, Cl. 73-861.120.
Friedrich Wilh. Schwing GmbH: *See*—
Schwing, Gerhard; and Pindras, Udo, 4,310,124, Cl. 241-46.110.
Frohbach, Hugh F.; Macovski, Albert; Peppers, Norman A.; Siwecki, Thomas L.; and Schaefer, Louis F., to World Development Laboratories. Color television film scanning system using uniform motion and line arrays. 4,310,847, Cl. 358-54.000.
Frost, Elmer F., Jr.; and Larsen, Gregory J., to FMC Corporation. High speed fruit feeding apparatus. 4,309,944, Cl. 100-104.000.
Frye, Bruce J. Self holding separable mount. 4,310,137, Cl. 248-467.000.
Fuchs, Alfred. Method and an arrangement for producing a curved sail. 4,309,824, Cl. 33-174.00G.

Fuchs, George L.: *See—*
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Fuchs, Hans-Ullrich: *See—*
Rucker, Norbert; Sellschopp, Michael; and Fuchs, Hans-Ullrich, 4,310,823, Cl. 338-2.000.

Fuchs, Werner: *See—*
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,310,345, Cl. 71-76.000.

Fuerneisen, Thomas J., to Microtime Incorporated. Adhesively attachable timepiece. 4,310,908, Cl. 368-88.000.

Fuji Kiko Kabushiki Kaisha: *See—*
Furusawa, Takeshi; and Yamamoto, Yoshimi, 4,310,176, Cl. 280-801.000.

Fuji Photo Film Co., Ltd.: *See—*
Akashi, Goro; and Fujiyama, Masaaki, 4,310,599, Cl. 428-413.000.
Fujita, Shinsaku; Koyama, Koichi; and Inagaki, Yoshio, 4,310,693, Cl. 564-440.000.
Hamada, Shinji; and Sakamoto, Kiichiro, 4,310,616, Cl. 430-309.000.
Hara, Yoshio; Takahashi, Tomoyuki; and Sugimoto, Yukihiro, 4,310,091, Cl. 206-455.000.
Ichijima, Seiji; Yabuki, Yoshiharu; Watanabe, Toshiyuki; and Furutachi, Nobuo, 4,310,619, Cl. 430-387.000.
Kato, Hisatoyo; Ishida, Masamitsu; and Matsumoto, Seiji, 4,310,886, Cl. 364-414.000.
Onda, Shinzaburo; Okutsu, Eiichi; Itoh, Isamu; and Mifune, Hiroyuki, 4,310,622, Cl. 430-445.000.
Watanabe, Toshiyuki; and Morigaki, Masakazu, 4,310,623, Cl. 430-505.000.

Fujii, John S.; Whalley, William G.; and Schmidt, Fred L., to Crown Zellerbach Corporation. Continuous countercurrent pretreatment of lignocellulose with anthraquinone prior to pulping. 4,310,383, Cl. 162-37.000.

Fujimoto, Sakae, to Ricoh Company, Ltd. Sheet feeding apparatus. 4,310,151, Cl. 271-11.000.

Fujimoto, Shyoichiro; and Ueno, Haruyuki, to Kurosaki Refractories Co., Ltd. Process for fabrication of dense-structure refractories which have resistance to spalling. 4,310,480, Cl. 264-56.000.

Fujisaki, Hitoshi: *See—*
Toyomura, Yasuhiro; Fujisaki, Hitoshi; and Onodera, Hideo, 4,310,810, Cl. 332-31.00T.

Fujishima, Tooru, to Hitachi, Ltd. Control information detecting method and apparatus in optical-type video disc player. 4,310,911, Cl. 369-45.000.

Fujita, Masanori, to Kabushiki Kaisha Seikosha. Analog electronic timepiece. 4,310,909, Cl. 368-240.000.

Fujita, Shinsaku; Koyama, Koichi; and Inagaki, Yoshio, to Fuji Photo Film Co., Ltd. o-Aminophenol compounds. 4,310,693, Cl. 564-440.000.

Fujitsu Limited: *See—*
Iijima, Nobuo, 4,310,764, Cl. 250-440.000.

Fujiyama, Masaaki: *See—*
Akashi, Goro; and Fujiyama, Masaaki, 4,310,599, Cl. 428-413.000.

Fukami, Harukazu: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; Fukami, Harukazu; Egawa, Mitsuo; and Ninomiya, Kunihiro, 4,310,534, Cl. 424-267.000.

Fukuda, Kyohei: *See—*
Sakurai, Soichi; Fukuda, Kyohei; and Takata, Masanobu, 4,310,780, Cl. 313-412.000.

Fukukita, Hiroshi: *See—*
Tachita, Ryobun; Hayakawa, Yoshihiro; Fukukita, Hiroshi; Yano, Tsutomu; Irioka, Kazuyoshi; and Fukumoto, Akira, 4,310,907, Cl. 367-11.000.

Fukumoto, Akira: *See—*
Tachita, Ryobun; Hayakawa, Yoshihiro; Fukukita, Hiroshi; Yano, Tsutomu; Irioka, Kazuyoshi; and Fukumoto, Akira, 4,310,907, Cl. 367-11.000.

Fukushima, Hiroshi; Soeno, Ko; Ando, Hisashi; Yamamoto, Shigehiko; and Aida, Toshiyuki, to Hitachi, Ltd. Directly heated cathode for electron tube. 4,310,777, Cl. 313-345.000.

Fukushima, Hiroshi: *See—*
Maeda, Akio; Hashimoto, Kinro; Inagami, Masaaki; and Fukushima, Hiroshi, 4,310,643, Cl. 525-468.000.

Fuller, Harrison W., to Sanders Associates, Inc. Dispersive delay lines. 4,310,816, Cl. 333-156.000.

Fuller, John J. Steerable propeller. 4,310,319, Cl. 440-51.000.

Funaki, Masaaki; Yoshida, Motoaki; Inatomi, Haruo; Kuriyama, Ryozo; and Oshima, Taizo, to Nippon Sheet Glass Co., Ltd.; and Sumitomo Chemical Company, Limited. Method for the manufacture of a colored nonfogging article. 4,310,330, Cl. 8-506.000.

Furuhashi, Toshio; Tokuda, Hiroastu; Suda, Seiji; and Imai, Masumi, to Hitachi, Ltd. Technique for controlling the starting operation of an electronic engine control apparatus. 4,310,888, Cl. 364-431.100.

Furukawa, Hisao: *See—*
Kato, Yasushi; Furukawa, Hisao; Matsumura, Shoichi; and Nakatsuka, Saori, 4,310,640, Cl. 525-100.000.

Furumura, Kyozaburo: *See—*
Ohkuma, Takeo; Furumura, Kyozaburo; Tanaka, Akihiko; and Shirota, Shinichi, 4,309,916, Cl. 74-467.000.

Furusawa, Takeshi; and Yamamoto, Yoshimi, to Fuji Kiko Kabushiki Kaisha. Seat belt locking device for an automobile vehicle. 4,310,176, Cl. 280-801.000.

Furutachi, Nobuo: *See—*
Ichijima, Seiji; Yabuki, Yoshiharu; Watanabe, Toshiyuki; and Furutachi, Nobuo, 4,310,619, Cl. 430-387.000.

G. L. Rexroth GmbH: *See—*
Dantlgraber, Jorg; Gossl, Dietmar; and Kramer, Horst, 4,310,290, Cl. 417-273.000.

Gach, Peter P., to Sunbeam Plastics Corporation. Child-resistant dispensing closure. 4,310,105, Cl. 222-153.000.

GAF Corporation: *See—*
Barabas, Eugene S.; Mallya, Prakash; and Gromelski, Stanley J., Jr., 4,310,687, Cl. 560-221.000.

Galick, Paul E.: *See—*
Lazarus, Stanley D.; Cooke, Robert S.; and Galick, Paul E., 4,310,658, Cl. 528-309.000.

Gallagher Electronics Limited Company: *See—*
Niven, Rex C. G., 4,310,869, Cl. 361-232.000.

Gallo-Torres, Hugo E.; and Shah, Navnit H., to Hoffmann-La Roche Inc. Prostaglandin compositions. 4,310,543, Cl. 424-305.000.

Galyan, Boris A.: *See—*
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Miroshnichenko, Alexandr P., 4,310,737, Cl. 219-59.100.

Gamble, Ronald C.: *See—*
Baldeschwieler, John D.; Gamble, Ronald C.; Mauk, Marcia R.; Shen, Tsung-Ying; and Ponpipom, Mitree M., 4,310,505, Cl. 424-1.000.
Baldeschwieler, John D.; Gamble, Ronald C.; and Mauk, Marcia R., 4,310,506, Cl. 424-1.000.

Gander, Robert J., to Johnson & Johnson. Novel retinoids and their use in preventing carcinogenesis. 4,310,546, Cl. 424-311.000.

GAO Gesellschaft fur Automation und Organisation mbH: *See—*
Mitzel, Wilhelm, 4,310,152, Cl. 271-186.000.

Gardner, Leland V., to United States of America, Army. Optical fuze with improved range function. 4,310,760, Cl. 250-338.000.

Garrison, Joe K.; and Claycomb, Brian C., to John D. Hollingsworth On Wheels, Inc. Carding trash removing apparatus and method. 4,309,796, Cl. 19-98.000.

Gasparovic, George M.: *See—*
Tyler, David O.; and Gasparovic, George M., 4,310,772, Cl. 313-113.000.

Gaul, John H.: *See—*
Baney, Ronald H.; and Gaul, John H., 4,310,651, Cl. 528-21.000.

Gaus, Frank D.; and Klabunde, Edwin C., to Superior Products, Inc. Sealant composition. 4,310,446, Cl. 260-28.5AS.

Gawler, David A., to Vickers Limited. Single revolution clutches, particularly for franking machines. 4,310,087, Cl. 192-142.00R.

Gaydecki, Jan, to Dunlop Limited. Elastomeric elements. 4,310,579, Cl. 428-105.000.

Gebauer, Hans-Jurgen: *See—*
Langecker, Gerhard; Gebauer, Hans-Jurgen; and Hermann, Heinrich, 4,310,500, Cl. 423-345.000.

Gebrueder Hofmann GmbH & Co. K.G. Maschinenfabrik: *See—*
Himmler, Guenther, 4,310,892, Cl. 364-508.000.

Geddes, David C. Stencil. 4,309,825, Cl. 33-174.00B.

Gehman, John T., to Nixdorf Computer Corporation. High-speed synchronous computer using pipelined registers and a two-level fixed priority circuit. 4,310,880, Cl. 364-200.000.

Gelotte, Karl O.; and Parady, Edward D., to Sterling Drug Inc. Low-temperature, aqueous conversion of 4-picoline derivative to 5-cyano-[3,4'-bipyridin]-6(1H)-one. 4,310,670, Cl. 546-257.000.

Gemvac: *See—*
Sakuma, Shinzo; and Warabi, Junichi, 4,310,735, Cl. 200-144.00B.

Genco, Louis V.; and Task, Harry L., to United States of America, Air Force. Field test unit for windscreen optical evaluation. 4,310,242, Cl. 356-128.000.

Genentech, Inc.: *See—*
Crea, Roberto, 4,310,662, Cl. 536-27.000.

General Aviation Electronics, Inc.: *See—*
Kennedy, Edmund E., 4,310,923, Cl. 455-79.000.

General Battery Corporation: *See—*
Eberle, William J.; and Mills, Robert J., III, 4,309,936, Cl. 91-405.000.
Eberle, William J., 4,310,280, Cl. 414-415.000.

General Dynamics Corp., Electronics Division: *See—*
Tricoles, Gus P., 4,310,852, Cl. 358-110.000.

General Dynamics, Pomona Division: *See—*
Block, Kenneth A., 4,309,946, Cl. 102-213.000.
Palmer, John P., 4,310,905, Cl. 367-140.000.

General Electric Company: *See—*
Bell, Robert A., 4,310,393, Cl. 204-59.00R.
Brunelle, Daniel J., 4,310,656, Cl. 528-200.000.
Carnahan, James C., Jr., 4,310,654, Cl. 528-174.000.
Crivello, James V., 4,310,469, Cl. 260-446.000.
Cutler, Scott E.; Eichelberger, Charles W.; and Haase, Michael A., 4,310,896, Cl. 364-900.000.
Hackert, William P.; and Hughes, William C., 4,310,805, Cl. 331-1.00A.
Koran, Kenneth W.; and Parry, William T., 4,309,873, Cl. 60-646.000.
Kornrumpf, William P.; and Harnden, John D., Jr., 4,310,837, Cl. 340-598.000.
West, Jon K.; LeDuc, Kenneth; and Ferrus, Serge, 4,310,421, Cl. 210-740.000.
Zukowski, Edward C.; and Sobieski, John C., 4,310,773, Cl. 313-221.000.

General Motors Corporation: *See—*
Baker, Benjamin H.; and Taylor, David W., 4,310,800, Cl. 324-78.00D.

Chiesa, Alan F.; Evans, David G.; Norford, James R.; and Zahorchak, John A., 4,309,971, Cl. 123-480.000.
Claude, George T.; and Burns, Jerry W., 4,310,172, Cl. 280-703.000.
Cross, William E.; and Nestor, Charles R., 4,310,719, Cl. 174-94.00R.
Kline, Richard H., 4,309,818, Cl. 29-623.100.
Klomp, Edward D., 4,309,966, Cl. 123-90.280.
LaFlame, Frank E., 4,310,085, Cl. 192-58.00B.
Leet, Warren E., 4,309,917, Cl. 74-861.000.
Matthes, William R., 4,309,969, Cl. 123-188.0VA.
Merkle, Ralph H., 4,310,171, Cl. 280-688.000.
Parker, James E., 4,310,014, Cl. 137-227.000.
Rogers, Lloyd W., Jr.; and Stephenson, Robert L., 4,310,177, Cl. 280-802.000.
Schardt, Michael M., 4,309,937, Cl. 92-240.000.
Sheldrake, Leonard J.; Olson, Stanley E.; and Karau, Philip A., 4,310,793, Cl. 322-28.000.
Shreve, John R.; and Vincent, Wesley A., 4,310,867, Cl. 361-90.000.
Sundeen, Arthur R.; and Elliott, Harold V., 4,310,174, Cl. 280-731.000.
TePastte, Albert, 4,310,123, Cl. 239-585.000.
Tyler, David O.; and Gasparovic, George M., 4,310,772, Cl. 313-113.000.
Varnau, Michael J.; and Gouge, William, 4,309,856, Cl. 52-506.000.
Winnale, James A.; Rogers, Lloyd W., Jr.; Compeau, Edward E.; and Billis, Albert E., 4,310,179, Cl. 280-803.000.

Gengelbach, Robert D., to Eastman Kodak Company. Adjusting copy contrast and density. 4,310,237, Cl. 355-14.00E.

Gentex Corporation: *See*—
Davis, John K., 4,310,225, Cl. 351-176.000.

Georget, Jean-Pierre, to Fives-Cail Babcock. Sugar cane mill facilities for the extraction of sugar from sugar cane. 4,310,361, Cl. 127-5.000.

Gerlach, Charles G.: *See*—
Mottershead, Frank R.; Konkal, John J.; and Gerlach, Charles G., 4,309,925, Cl. 82-12.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Weirich, Walter, 4,310,027, Cl. 137-637.200.

Giesecke, Heinz; and Brack, Alfred, to Bayer Aktiengesellschaft. Process for the preparation of pyridine-4-aldehyde phenylhydrazones. 4,310,664, Cl. 542-417.000.

Gilain, Jacques: *See*—
Vanlautem, Noel; and Gilain, Jacques, 4,310,684, Cl. 560-185.000.

Gilbert, Charles H.: *See*—
Wyman, Ransome J.; Alshin, Richard A.; and Gilbert, Charles H., 4,310,042, Cl. 152-322.000.

Gillette Company, The: *See*—
Terry, John C.; and Taylor, John B., 4,309,821, Cl. 30-32.000.

Gilmore, Thomas: *See*—
Neu, Horst W.; Gilmore, Thomas; and McCann, Farrell A., 4,310,269, Cl. 408-11.000.

Gimpel, Juergen; Hartmann, Heinrich; and Schenck, Hans-Uew, to BASF Aktiengesellschaft. Surface-coating binders and their use for electrocoating finishes. 4,310,398, Cl. 204-181.00C.

Girard, Henry; and Buhler, Rudolf, to Chemap AG. Arrangement for cultivating cells of animal and human tissues. 4,310,630, Cl. 435-284.000.

Givat Chaim-Ichud: *See*—
Cohen, William, 4,310,022, Cl. 137-624.180.

Givens, Wyatt W., to Mobil Oil Corporation. Neutron accelerator tube having improved ionization section. 4,310,765, Cl. 250-493.000.

Gladden, Robert H., Jr.: *See*—
Fleming, Mills L.; Fuchs, George L.; Gladden, Robert H., Jr.; and Ross, Robert R., 4,310,209, Cl. 339-14.00R.

Glass, James E.: *See*—
Hibbitts, Charles H.; Price, Byron F.; Cogbill, Everett C.; Kelly, James G.; and Glass, James E., 4,310,006, Cl. 131-290.000.

Glass, Stuart M. Stereoscopic video system. 4,310,849, Cl. 358-88.000.

Gobien, Ernst: *See*—
Sorsche, Joachim H.; Ableitner, Erich; Gobien, Ernst; and Minning, Manfred, 4,309,970, Cl. 123-198.00D.

Goebel, Franz; and Hansen, Ibsen R., to GTE Products Corporation. Method for assembling an electrochemical cell. 4,309,817, Cl. 29-623.100.

Goebel, Franz, to GTE Products Corporation. Method for assembling an electrochemical cell. 4,309,819, Cl. 29-623.100.

Goens, Duane N.: *See*—
Ruskan, Richard P.; Zafar, Humayon Z.; Goens, Duane N.; Hyatt, David E.; and Kenney, Charlie W., 4,310,490, Cl. 422-188.000.

Goetsch, Albert H.: *See*—
Loy, Jeffrey A.; Goetsch, Albert H.; and Lahman, John W., 4,310,187, Cl. 292-56.000.

Goldberg, Erwin, to Northwestern University. Antigenic linear peptide compound. 4,310,456, Cl. 260-112.50R.

Gomez, Jim H.; and Davila, Jose E., to Transit Systems Technology, Inc. Fare collection system and components thereof. 4,310,749, Cl. 235-29.00R.

Gonzalez, Cesar R., to Amper S.A. Current detector circuit. 4,310,724, Cl. 179-18.0FA.

Goodyear Tire & Rubber Company, The: *See*—
Watts, George T., 4,310,041, Cl. 152-187.000.

Gorog, Sandor: *See*—
Jovanovics, Karola; and Gorog, Sandor, 4,310,528, Cl. 424-262.000.

Gossl, Dietmar: *See*—
Dantlgraber, Jorg; Gossl, Dietmar; and Kramer, Horst, 4,310,290, Cl. 417-273.000.

Gossoo, Rodney W.: *See*—
Mitrzyk, Jan C., Sr.; Gossoo, Rodney W.; Fischer, Charles P.; Silvernail, Howard N.; and Null, Charles, 4,309,928, Cl. 83-161.000.

Gouge, William: *See*—
Varnau, Michael J.; and Gouge, William, 4,309,856, Cl. 52-506.000.

Grab, Frederick L.: *See*—
Granatek, Edmund S.; Ziemba, Gerald M.; and Grab, Frederick L., 4,310,515, Cl. 424-131.000.

Granatek, Edmund S.; Ziemba, Gerald M.; and Grab, Frederick L., to Bristol-Myers Company. Pharmaceutical compositions of cisplatin. 4,310,515, Cl. 424-131.000.

Granda, Edward J.: *See*—
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,310,681, Cl. 560-120.000.

Granlund, Lars A.: *See*—
Ekman, Gunnar O.; and Granlund, Lars A., 4,310,364, Cl. 149-2.000.

Grebe, John C., Jr.; and Freund, William R., Jr., to Emerson Electric Co. Crystal stabilized voltage to frequency converter with digital calibration for flowmeters. 4,309,909, Cl. 73-861.120.

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Green, Alan C.; and Gregory, Stephen D., to Lucas Industries Limited. Liquid fuel pumping apparatus. 4,310,291, Cl. 417-435.000.

Greenberg, Louis E., to AMF Incorporated. Tennis racket. 4,310,157, Cl. 273-73.00C.

Greene, Robert A.: *See*—
Choy, Clement K.; and Greene, Robert A., 4,310,434, Cl. 252-174.210.

Gregory, Stephen D.: *See*—
Green, Alan C.; and Gregory, Stephen D., 4,310,291, Cl. 417-435.000.

Gresen Manufacturing Company: *See*—
Determan, Roger G., 4,310,143, Cl. 251-30.000.

Gress, Manfred, to Schering AG. Method of and a device for vaporizing and recovering water from aqueous solutions. 4,310,382, Cl. 159-16.00R.

Grethe, Guenter; Uskokovic, Milan R.; and Sereno, John, to Hoffmann-La Roche Inc. Process for the preparation of methyl 3,4-anhydro-2,6-dideoxy-L-ribohexopyranoside. 4,310,462, Cl. 260-343.500.

Gretz, Bonita M.; Lewis, J. Stephen; and Shireman, Cyril G., to Mattel, Inc. Child's simulated jewelry item. 4,309,879, Cl. 63-29.00R.

Griesemann nee Laporte, Michele-Gabrielle R.: *See*—
Aron nee Rosa, Daniele S.; and Griesemann nee Laporte, Michele-Gabrielle R., 4,309,998, Cl. 128-303.100.

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Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,310,472, Cl. 260-465.400.

Gromelski, Stanley J., Jr.: *See*—
Barabas, Eugene S.; Mallya, Prakash; and Gromelski, Stanley J., Jr., 4,310,687, Cl. 560-221.000.

Gross, James R., to Dow Chemical Company, The. Absorbent articles cured with amine-epihalohydrin adducts. 4,310,593, Cl. 428-290.000.

Grossi, Oscar, to Officine Savio S.p.A. Rotating ring for spinning and twisting machines. 4,309,868, Cl. 57-124.000.

Grossman, David G., to Corning Glass Works. Stain-resistant mica compositions for dental products and processes or the like. 4,310,311, Cl. 433-199.000.

Gruhier, Henri: *See*—
Deschamps, Andre; Dezael, Claude; Franckowiak, Sigismond; and Gruhier, Henri, 4,310,497, Cl. 423-230.000.

Grunwald, Ronald P. Cardiovascular cannula. 4,309,994, Cl. 128-214.00R.

GTE Products Corporation: *See*—
Goebel, Franz; and Hansen, Ibsen R., 4,309,817, Cl. 29-623.100.
Goebel, Franz, 4,309,819, Cl. 29-623.100.
Karlotski, Robert J.; and Work, Dale E., 4,310,774, Cl. 313-228.000.

Gudmandsen, Robert: *See*—
Hansen, Bjarne S.; Andersen, Knud H.; and Gudmandsen, Robert, 4,310,917, Cl. 369-170.000.

Guest, Neil A.; and Krisner, James F., to Carrier Corporation. Lubricating system for a turbomachine including a method of operating same. 4,309,870, Cl. 60-39.080.

Guilloteau, Rene; and Segui, Jacques, to Commissariat a l'Energie Atomique. Joining apparatus between a transportation container and a horizontal wall of a discharge. 4,310,034, Cl. 141-98.000.

Gulbins, Erich: *See*—
Kempter, Fritz E.; Schupp, Eberhard; Schenck, Hans-Uwe; and Gulbins, Erich, 4,310,645, Cl. 525-526.000.

Gulf Research & Development Company: *See*—
Beach, David L.; and Harrison, James J., 4,310,716, Cl. 585-526.000.

Gullett, John R., to Moore Business Forms, Inc. Envelope. 4,310,117, Cl. 229-73.000.

Gullo, James M.; Heilman, William P.; Wayner, Robert J.; and Moser, Robert E., to Diamond Shamrock Corporation. Pharmacologically active substituted 1,2,4-triazines. 4,310,551, Cl. 424-249.000.

Gunter, John, to RCA Corporation. Dual parallelogram cutterhead suspension apparatus. 4,310,915, Cl. 369-251.000.

Gupta, Amitava; and Yavrouian, Andre H., to California Institute of Technology. Ultraviolet absorbing copolymers. 4,310,650, Cl. 526-313.000.

Gupta, Tarun K. S.: *See—*
Sheasby, Peter G.; Cheetham, Graham; Stuckart, Rainer W. M.; and Gupta, Tarun K. S., 4,310,586, Cl. 428-220.000.

Gurries, Raymond A.; and Stormon, Harry J., to Resonant Technology Company. Resonance aided earth-working equipment. 4,310,054, Cl. 172-40.000.

Guzowski, Chester D. Ventilating helmet. 4,309,774, Cl. 2-8.000.

H & H Tube & Mfg. Co.: *See—*
Higgins, Clifford H., Jr., 4,309,987, Cl. 126-448.000.

Haas, Peter; Blahak, Johannes; and Wiedermann, Rolf, to Bayer Aktiengesellschaft. Hexahydrotriazine carboxylates and the use thereof as catalysts in the production of polyisocyanurate plastics. 4,310,633, Cl. 521-129.000.

Haase, Michael A.: *See—*
Cutler, Scott E.; Eichelberger, Charles W.; and Haase, Michael A., 4,310,896, Cl. 364-900.000.

Hackert, William P.; and Hughes, William C., to General Electric Company. Phase-locked loop stabilized by a crystal oscillator. 4,310,805, Cl. 331-1.00A.

Haga, Takahiro: *See—*
Nishiyama, Ryuzo; Haga, Takahiro; Toki, Tadaaki; Koyanagi, Tohru; and Murai, Shigeo, 4,310,530, Cl. 424-263.000.

Hagemeyer, Hugh J., Jr.; and Edwards, Marvin B., to Eastman Kodak Company. Polyallomers and process for preparing same. 4,310,639, Cl. 525-247.000.

Hajos, Andor; Fekete, Marton; Kurti, Marianna; Lang, Tibor; Toldy, Lajos; Borvendeg, Janos; Nagy, Laszlo; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan. Treatment of hypertension with 1-tert.-butylamino-3-(2,5-dichlorophenoxy)-2-propanol. 4,310,549, Cl. 424-330.000.

Hakes, Gary A.: *See—*
McCracken, William E.; and Hakes, Gary A., 4,310,197, Cl. 299-11.000.

Halabs, Incorporated: *See—*
Key, Morris D.; and Crawford, William H., Jr., 4,310,425, Cl. 252-8.50A.

Hall, Donald R.: *See—*
Worn, Philip R.; Stanziola, Ralph A.; and Hall, Donald R., 4,310,314, Cl. 434-101.000.

Hall, John B.: *See—*
Wilson, Richard A.; Mookherjee, Braja D.; Hall, John B.; and Stork, Gilbert, 4,310,701, Cl. 568-347.000.

Halldin, Henry, to ASEA Aktiebolag. Wheels having hard particles distributed in metallic tread. 4,310,191, Cl. 295-31.00R.

Halliburton Company: *See—*
Streich, Steven G., 4,310,265, Cl. 405-227.000.

Halliburton Services: *See—*
Streich, Steven G., 4,310,161, Cl. 277-34.000.

Haluda, Raymond P.: *See—*
Johannesen, Donald D.; and Haluda, Raymond P., 4,310,075, Cl. 188-73.450.

Hamada, Mitsuo; and Yasuda, Sadami, to Toray Silicone Company, Ltd. Flame retardant silicone rubber compositions. 4,310,444, Cl. 260-18.00S.

Hamada, Shinji; and Sakamoto, Kiichiro, to Fuji Photo Film Co., Ltd. Method and apparatus for developing and treating PS plates. 4,310,616, Cl. 430-309.000.

Hamada, Yoshiki: *See—*
Ozawa, Isao; Ito, Tomiyoshi; Hamada, Yoshiki; and Takeuchi, Isao, 4,310,682, Cl. 560-142.000.

Hamaguchi, Shigeki: *See—*
Hasegawa, Junzo; Ogura, Masahiro; Hamaguchi, Shigeki; Shimazaki, Masami; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,310,635, Cl. 435-146.000.

Hammann, Ingeborg: *See—*
Lantzsch, Reinhard; Marhold, Albrecht; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,310,540, Cl. 424-282.000.

Hammitt, Dale D.: *See—*
Waldron, Robert D., 4,310,334, Cl. 48-197.00R.

Hanke, Hans: *See—*
Peter, Wolfgang; and Hanke, Hans, 4,310,321, Cl. 474-14.000.

Hanley, Harold G.: *See—*
Kia, Mansor; and Hanley, Harold G., 4,310,870, Cl. 361-415.000.

Hansaloy Corporation: *See—*
Wright, Stephen C., 4,309,930, Cl. 83-820.000.

Hansen, Bjarne S.; Andersen, Knud H.; and Gudmandsen, Robert, to Ortofon Manufacturing A/S. Pick-up. 4,310,917, Cl. 369-170.000.

Hansen, Ibsen R.: *See—*
Goebel, Franz; and Hansen, Ibsen R., 4,309,817, Cl. 29-623.100.

Hanula, Richard M., to Midland-Ross Corporation. Rotary connector. 4,310,099, Cl. 213-62.00A.

Hanyu, Susumu; and Tonomura, Yoshinobu, to Janome Sewing Machine Co., Ltd. Speed control device of sewing machines. 4,310,788, Cl. 318-551.000.

Hara, Yoshio; Takahashi, Tomoyuki; and Sugimoto, Yukihiro, to Fuji Photo Film Co., Ltd. Film-packet to be adaptable for picture stand. 4,310,091, Cl. 206-455.000.

Harbert, Charles A.: *See—*
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,310,529, Cl. 424-263.000.
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Harbulak, Edward P., to Chrysler Corporation. Method for simultaneous determination of thickness and electrochemical potential in multilayer plated deposits. 4,310,389, Cl. 204-1.00T.

Harding, Phillip A.; Chong, Carlos F.; and Pockell, Herman L., to Electronic Memories & Magnetics Corporation. Address mapping for memory. 4,310,901, Cl. 365-200.000.

Hareng, Michel; Le Berre, Serge; and Leclerc, Pierre, to Thomson-CSF. Telecopying process employing a cell having a smectic liquid crystal and a transmitter-receiver telecopier employing said process. 4,310,858, Cl. 358-302.000.

Haring, Richard, to SI Handling Systems, Inc. Driverless vehicle speed retarder. 4,310,073, Cl. 188-62.000.

Harmon, John R. Smoker device. 4,309,938, Cl. 99-477.000.

Harnden, John D., Jr.: *See—*
Kornrumpf, William P.; and Harnden, John D., Jr., 4,310,837, Cl. 340-598.000.

Harrington, Alan L., to TRW Inc. Method of adhesion of passivation layer to gold metalization regions in a semiconductor device. 4,310,569, Cl. 427-89.000.

Harrington, Edgar F.: *See—*
Jones, William R.; and Harrington, Edgar F., 4,309,904, Cl. 73-597.000.

Harris Corporation: *See—*
Hull, Richard, 4,309,813, Cl. 29-580.000.

Harris, Joel M.; and Dovichi, Norman J., to University of Utah. Calorimetric trace analysis by laser induced thermal lens method. 4,310,762, Cl. 250-343.000.

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Beach, David L.; and Harrison, James J., 4,310,716, Cl. 585-526.000.

Harrison, John P. Reinforcer applicator. 4,310,379, Cl. 156-541.000.

Hartmann, Heinrich: *See—*
Gimpel, Juergen; Hartmann, Heinrich; and Schenck, Hans-Uew, 4,310,398, Cl. 204-181.00C.
Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Kohl, Albert; Spoor, Herbert; Mahler, Karl; and Balz, Werner, 4,310,565, Cl. 427-48.000.

Hasegawa, Junzo; Ogura, Masahiro; Hamaguchi, Shigeki; Shimazaki, Masami; Kawaharada, Hajime; and Watanabe, Kiyoshi, to Kanegafuchi Chemical Industry Co., Ltd. Fermentative production of D(−)-β-hydroxyisobutyric acid. 4,310,635, Cl. 435-146.000.

Hasegawa, Yoichi: *See—*
Hojo, Shiro; Hasegawa, Yoichi; and Nakagawa, Mineo, 4,310,696, Cl. 564-464.000.

Hashimoto, Junichiro: *See—*
Mochizuki, Manabu; Miyakawa, Seiichi; Kimura, Taro; and Hashimoto, Junichiro, 4,310,238, Cl. 355-14.00D.

Hashimoto, Kinro: *See—*
Maeda, Akio; Hashimoto, Kinro; Inagami, Masaaki; and Fukushima, Hiroshi, 4,310,643, Cl. 525-468.000.

Hatem, John P. Fluid heater powered by microwave energy. 4,310,739, Cl. 219-10.55A.

Hauck, Karl: *See—*
Appoldt, Hans; Wagner, Werner; Hauck, Karl; and Baur, Reinhold, 4,310,371, Cl. 156-227.000.

Hauser, Fred, to Hydro-Rain Inc. Control valve. 4,310,021, Cl. 137-624.200.

Hayakawa, Yoshihiro: *See—*
Tachita, Ryobun; Hayakawa, Yoshihiro; Fukukita, Hiroshi; Yano, Tsutomu; Irioka, Kazuyoshi; and Fukumoto, Akira, 4,310,907, Cl. 367-11.000.

Hayes, Mark J.: *See—*
Smith, Avery B.; and Hayes, Mark J., 4,310,406, Cl. 204-275.000.

Hayes, William A. Single sideband AM-FM stereo modulation system. 4,310,920, Cl. 370-11.000.

Hedrick, Edward F.: *See—*
Fremont, Henry A.; Obenour, Mary C.; and Hedrick, Edward F., 4,310,424, Cl. 210-791.000.

Heidt, Thomas D.: *See—*
Williams, Jonathan R.; and Heidt, Thomas D., 4,310,840, Cl. 340-724.000.

Heil-Quaker Corporation: *See—*
Ketterer, Edward A., 4,309,947, Cl. 110-203.000.

Heilenz, Siegfried. Method and apparatus for operating a water-jet pump. 4,310,287, Cl. 417-54.000.

Heilman, William P.: *See—*
Gullo, James M.; Heilman, William P.; Wayner, Robert J.; and Moser, Robert E., 4,310,551, Cl. 424-249.000.

Heimann GmbH: *See—*
Steinhage, Peter-Wilhelm; and Heinz, Roland, 4,310,781, Cl. 313-180.000.

Heinz, Roland: *See—*
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Brooks, William R.; and Heinzel, Irving C., 4,309,990, Cl. 128-90.000.

Heller, Adam, to Bell Telephone Laboratories, Incorporated. Device for the photoelectrochemical generation of hydrogen at p-type semiconductor electrodes. 4,310,405, Cl. 204-252.000.

Hellin, Michel: *See—*
Torck, Bernard; Convers, Alain; Asselineau, Lionel; and Hellin, Michel, 4,310,710, Cl. 568-697.000.

Hemsworth, George R.: *See—*
Wolff, John S., III; Hemsworth, George R.; and Jensen, Keith E., 4,310,550, Cl. 424-365.000.

Henderson, Alva E.; and Frantz, Gene A., to Texas Instruments Incorporated. Pulse width modulated, push/pull digital to analog converter. 4,310,831, Cl. 340-347.00M.

Hensiek, Charles R.; Mutchler, Paul A.; and Timms, Rayford W., to American Air Filter Company, Inc. Forced air heater. 4,309,978, Cl. 126-110.00B.

Herbst, Richard L.: *See—*
Byer, Robert L.; and Herbst, Richard L., 4,310,808, Cl. 331-94.50C.

Hermann, Heinrich: *See—*
Langecker, Gerhard; Gebauer, Hans-Jurgen; and Hermann, Heinrich, 4,310,500, Cl. 423-345.000.

Hesch, Georg: *See—*
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Hess, Ricky D.: *See—*
Buck, Daniel C.; Hess, Ricky D.; and Niehenke, Edward C., 4,310,809, Cl. 331-117.00D.

Hesselmann, Karlheinz; Tschiers, Bernhard; and Ertl, Ludwig, to Planatolwerk W. Hesselmann, Chemische und Maschinenfabrik fur Klebetechnik. Adhesive-applying apparatus and method. 4,310,576, Cl. 427-428.000.

Heubner, Ulrich: *See—*
Nann, Eberhard; and Heubner, Ulrich, 4,310,353, Cl. 75-166.00B.

Heyer, David E., to Du Pont de Nemours, E. I., and Company. Device for uniform web pinning. 4,310,295, Cl. 425-224.000.

Heyman, Joseph S.: *See—*
Cantrell, John H., Jr.; Heyman, Joseph S.; Yost, William T.; Torbett, Michael A.; and Breazeale, Mack A., 4,310,906, Cl. 367-181.000.

Heynisch, Hinrich, to Siemens Aktiengesellschaft. Dispenser cathode, particularly a metal capillary cathode. 4,310,775, Cl. 313-346.00R.

Hibbitts, Charles H.; Price, Byron F.; Cogbill, Everett C.; Kelly, James G.; and Glass, James E., to American Brands, Inc. Method and apparatus for expanding tobacco. 4,310,006, Cl. 131-290.000.

Hiersig, Heinz M.; and Wedler, Herbert, to Mannesmann Aktiengesellschaft. Controlled transmission system. 4,309,914, Cl. 74-15.400.

Higgins, Clifford H., Jr., to H & H Tube & Mfg. Co. Fluid flow assembly for solar heat collectors or radiators. 4,309,987, Cl. 126-448.000.

Hilbig, Josef; Holst, Arno; Kunkler, Hans; Stolting, Klaus; and Schminke, Wolfgang, to Hoechst Aktiengesellschaft. Continuous process for producing water-soluble hydroxyalkyl cellulose and related ethers. 4,310,663, Cl. 536-91.000.

Hill, Frederick W. L.; and Clabburn, Robin J. T., to Raychem Limited. Method of making composite connector and using same. 4,309,807, Cl. 29-446.000.

Hill, Richard C., to University of Maine, Board of Trustees of the. Vertical feed stick wood fuel burning furnace system. 4,309,965, Cl. 122-15.000.

Himmler, Guenther, to Gebrueder Hofmann GmbH & Co. K.G. Maschinenfabrik. Method for determining imbalance in a mechanical system. 4,310,892, Cl. 364-508.000.

Hinrichs, Lansing M.: *See—*
Fahrig, Robert J.; and Hinrichs, Lansing M., 4,310,489, Cl. 422-110.000.

Hioka, Minoru: *See—*
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Hirakawa, Kikuya: *See—*
JPX; Takahashi, Keiichi; Aoyama, Hiroshi; Hirakawa, Kikuya; and Sarusawa, Yukio, 4,309,952, Cl. 413-12.000.

Hirata, Isao, to Sony Corporation. Tone arm driving apparatus. 4,310,918, Cl. 369-215.000.

Hirosawa, Makoto: *See—*
Sakamoto, Seiya; Saito, Isao; Hirosawa, Makoto; and Hohki, Tetsuo, 4,310,234, Cl. 354-298.000.

Hitachi Denshi K.K.: *See—*
Toyomura, Yasuhiro; Fujisaki, Hitoshi; and Onodera, Hideo, 4,310,810, Cl. 332-31.00T.

Hitachi, Ltd.: *See—*
Fujishima, Tooru, 4,310,911, Cl. 369-45.000.
Fukushima, Hiroshi; Soeno, Ko; Ando, Hisashi; Yamamoto, Shigehiko; and Aida, Toshiyuki, 4,310,777, Cl. 313-345.000.
Furuhashi, Toshio; Tokuda, Hiroastu; Suda, Seiji; and Imai, Masumi, 4,310,888, Cl. 364-431.100.
Imai, Masumi; Takato, Masao; and Tokuda, Hiroastu, 4,310,889, Cl. 364-431.040.
Oka, Hitoshi; Nakamura, Kenji; Yokono, Hitoshi; Isogai, Tokio; Matsuo, Akira; Miyazawa, Osamu; and Tanaka, Isamu, 4,310,563, Cl. 427-8.000.
Sakamoto, Masakatsu; Uchida, Kenji; Kamino, Yukishige; and Saito, Makoto, 4,310,491, Cl. 422-234.000.
Sakurai, Soichi; Fukuda, Kyohei; and Takata, Masanobu, 4,310,780, Cl. 313-412.000.
Yamagishi, Ryozo; Mita, Mamoru; Yoshioka, Osamu; and Ishikawa, Tetsuo, 4,309,959, Cl. 118-664.000.
Yoshida, Kazutoshi, 4,310,898, Cl. 365-6.000.

Hobbs, Howard K.: *See—*
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Suggs, James L.; Buck, Dan F.; and Hobbs, Howard K., 4,310,557, Cl. 426-96.000.

Hodshire, Vincent B. Fishing apparatus having multiple floats. 4,309,838, Cl. 43-15.000.

Hoechst Aktiengesellschaft: *See—*
Erckel, Rudiger; and Rosch, Gunter, 4,310,665, Cl. 542-435.000.
Hilbig, Josef; Holst, Arno; Kunkler, Hans; Stolting, Klaus; and Schminke, Wolfgang, 4,310,663, Cl. 536-91.000.
Legutke, Gunter; Rechmeier, Gerhard H.; Scholz, Harald; Schuchardt, Kurt; Holler, Ernst; and Liesenfelder, Gunther, 4,310,713, Cl. 570-243.000.
Muller, Helmut; and Baessler, Konrad, 4,310,711, Cl. 568-709.000.

Hoelscher, Darrel G. Tilting platform hay bale accumulator. 4,310,275, Cl. 414-111.000.

Hoffman, Walter E. Golf club and grip therefor. 4,310,158, Cl. 273-81.300.

Hoffmann, Arthur K.: *See—*
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, 4,310,672, Cl. 548-155.000.

Hoffmann-La Roche Inc.: *See—*
Batcho, Andrew D.; Berger, Donald E., Jr.; and Uskokovic, Milan R., 4,310,467, Cl. 260-397.500.
Gallo-Torres, Hugo E.; and Shah, Navnit H., 4,310,543, Cl. 424-305.000.
Grethe, Guenter; Uskokovic, Milan R.; and Sereno, John, 4,310,462, Cl. 260-343.500.
Olson, Gary L.; and Saucy, Gabriel, 4,310,465, Cl. 260-396.00R.
Rahm, Jurg; and Waltz, Lothar, 4,310,488, Cl. 422-102.000.

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Hojo, Shiro; Hasegawa, Yoichi; and Nakagawa, Mineo, to Japan Hydrazine Co., Inc. Process for producing inorganic acid salts of tertiary butyl hydrazine. 4,310,696, Cl. 564-464.000.

Hold, Peter: *See—*
Scharer, Hans R.; D'Amato, Dominic A.; Hold, Peter; and Hubner, Manfred, 4,310,251, Cl. 366-77.000.

Holick, Michael F., to Massachusetts General Hospital. Sunscreen compositions containing $\Delta^{5,7}$steroidal dienes. 4,310,511, Cl. 424-59.000.

Holland, David O., to Combe Incorporated. Aqueous compositions for darkening keratinous materials. 4,310,329, Cl. 8-404.000.

Holler, Ernst: *See—*
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Holzermer, Gunter: *See—*
Finkenzeller, Joahnn; and Holzermer, Gunter, 4,310,766, Cl. 250-509.000.

Holzgrafe, James R., to Ampex Corporation. Efficient multichannel automatic setup and remote control system. 4,310,855, Cl. 358-210.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Nishikawa, Masao, 4,310,063, Cl. 180-143.000.

Honeywell Inc.: *See—*
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Hoover Universal, Inc.: *See—*
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Hoppie, Lyle O., to Eaton Corporation. Regenerative braking device. 4,310,079, Cl. 192-4.00A.

Horacek, Heinrich; Barl, Manfred; Wurmb, Rolf; and Marx, Matthias, to BASF Aktiengesellschaft. Process for the manufacture of polyurethane foam. 4,310,632, Cl. 521-121.000.

Hori, Yumiko: *See—*
Ichikawa, Michihiro, 4,309,867, Cl. 57-58.300.

Horike, Masanori, to Ricoh Company, Ltd. Deflection compensated ink ejection printing apparatus. 4,310,846, Cl. 346-75.000.

Horng, Cheng T.; Schwenker, Robert O.; and Tsang, Paul J., to International Business Machines Corporation. Process for fabricating improved bipolar transistor utilizing selective etching. 4,309,812, Cl. 29-578.000.

Horseling, Jan, to U.S. Philips Corporation. Television camera tube with antihalo plate. 4,310,778, Cl. 313-371.000.

Horton, Robert L., to Phillips Petroleum Co. Signal-to-noise ratio in chromatographic analysis. 4,309,898, Cl. 73-23.100.

Hotchkiss, John E., Jr. Tool rack. 4,310,094, Cl. 211-60.00T.

Hottinger Baldwin Measurements, Inc.: *See—*
Rapp, Christoph; and Mikulecki, Karl, 4,309,908, Cl. 73-720.000.

Howard, James K.; Rosenberg, William D.; and White, James F., to International Business Machines Corporation. Method of fabricating improved Schottky barrier contacts. 4,310,568, Cl. 427-84.000.

Hozumi, Toshiaki: *See—*
Okuyama, Takeshi; Hozumi, Toshiaki; and Wakabayashi, Hiroshi, 4,310,233, Cl. 354-212.000.

Hsu, George C.: *See—*
Kalvinskas, John J.; Hsu, George C.; and Ernest, John B., 4,310,049, Cl. 166-267.000.

Huber, Hans: *See—*
Bauer, Kurt; Hesch, Georg; Huber, Hans; Markert, Helmut; and Roth, Christian, 4,309,790, Cl. 15-250.420.

Hubner, Manfred: *See—*
Scharer, Hans R.; D'Amato, Dominic A.; Hold, Peter; and Hubner, Manfred, 4,310,251, Cl. 366-77.000.

Huebner Bros. of Canada Ltd.: *See—*
Bender, Joseph, 4,310,745, Cl. 219-213.000.

Huff, Arlen L., to Monnig, Robert A. Camping trailer having a fold out body and including a frame supporting a tent. 4,310,195, Cl. 296-173.000.

Hughes Aircraft Company: *See*—
Calhoun, Donald F., 4,309,811, Cl. 29-574.000.
Seliger, Robert L., 4,310,743, Cl. 219-121.0EB.

Hughes, William C.: *See*—
Hackert, William P.; and Hughes, William C., 4,310,805, Cl. 331-1.00A.

Hulin, Jean Pierre, to Lignes Telegraphiques et Telephoniques. Apparatus for producing cable elements incorporating otpical fibers. 4,309,864, Cl. 57-6.000.

Hull, Richard, to Harris Corporation. Mask alignment scheme for laterally and totally dielectrically isolated integrated circuits. 4,309,813, Cl. 29-580.000.

Hunt, Helen M. Articulated shoe sole. 4,309,832, Cl. 36-32.00R.

Hunt, LaWanda M.; Thompson, Malcolm J.; and Robbins, William E., to United States of America, Agriculture. Control of parasitic ticks. 4,310,547, Cl. 424-325.000.

Hunter, Paul W.; and Malaccorto, Alexander E., to International Business Machines Corporation. DAS Device command execution sequence. 4,310,882, Cl. 364-200.000.

Huss, Jerry L., to Hoover Universal, Inc. Apparatus and method for removal of flash from containers. 4,310,112, Cl. 225-3.000.

Huss, Rainer; and Peters, Werner, to SEP Gesellschaft fur technische Studien Entwicklung Planung mbH. Process for electrolytic recovery of nickel from solution. 4,310,395, Cl. 204-112.000.

Hutchison, James M. S.; Sutherland, Robert J.; Edelstein, William A.; and Mallard, John R., to National Research Development Corporation. Coil winding for quadrupolar fields. 4,310,799, Cl. 324-319.000.

Hyatt, David E.: *See*—
Ruskan, Richard P.; Zafar, Humayon Z.; Goens, Duane N.; Hyatt, David E.; and Kenney, Charlie W., 4,310,490, Cl. 422-188.000.

Hyatt, Gilbert P. Digital feedback control system. 4,310,878, Cl. 364-183.000.

Hydril Co.: *See*—
Mott, James D., 4,310,048, Cl. 166-212.000.
Mott, James D., 4,310,051, Cl. 166-323.000.

Hydro-Rain Inc.: *See*—
Hauser, Fred, 4,310,021, Cl. 137-624.200.

I.C.S. Cidneo S.p.A.: *See*—
Fantetti, Giuseppe, 4,309,780, Cl. 4-234.000.

Ichijima, Seiji; Yabuki, Yoshiharu; Watanabe, Toshiyuki; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Color photographic material and process incorporating a novel magenta coupler. 4,310,619, Cl. 430-387.000.

Ichikawa, Katsuzo: *See*—
Ichikawa, Michihiro, 4,309,867, Cl. 57-58.300.

Ichikawa, Michihiro, to Ichikawa, Katsuzo; and Hori, Yumiko. Yarn covering apparatus. 4,309,867, Cl. 57-58.300.

Ichikawa, Shigeo; Nomichi, Satoru; and Sinoda, Masaki, to Taiho Kogyo Co., Ltd. Method of forming a cylindrical member. 4,309,890, Cl. 72-368.000.

Ichikawa, Toshizi; Watanabe, Teruko; and Asada, Yoshimitus, to Terumo Corporation. α-Olefin-dialkylmaleate-based liquid separating agent. 4,310,430, Cl. 252-60.000.

Ichimiya, Yoshichika; Sudo, Tsuneta; Maruyama, Hiromi; Sugamori, Shigeru; Sumida, Susumu; and Tokuno, Takashi, to Nippon Telegraph & Telephone Public Corp.; and Takeda Riken Kogyo Kabushiki Kaisha. Logical waveform generator. 4,310,802, Cl. 328-110.000.

Ichinose, Isao: *See*—
Kunimoto, Go; Ichinose, Isao; Suzuki, Noboru; and Mori, Fumio, 4,310,100, Cl. 215-228.000.

Ichiyanagi, Takashi; Imanishi, Kiyokazu; Kawa, Hidetoshi; and Yamamoto, Katsuyuki, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for taking up tape. 4,310,130, Cl. 242-179.000.

ICI Australia Limited: *See*—
Serban, Alexander; Farquharson, Graeme; Lydiate, Jack; and Bird, Graham J., 4,310,347, Cl. 71-93.000.

Idelman, Lloyd B.: *See*—
Oliver, Robert J.; Lindblom, Kenneth J.; Idelman, Lloyd B.; and Medo, Carl S., 4,310,026, Cl. 137-637.000.

Iguchi, Shigeru; and Emoto, Kazuhiro, to Mitsubishi Paper Mills, Ltd. Liquid processing composition for silver complex diffusion transfer process. 4,310,613, Cl. 430-251.000.

Ihashi, Takao: *See*—
Kikuchi, Masahiro; Okada, Hitoshi; Ihashi, Takao; and Kaji, Takeo, 4,310,912, Cl. 369-43.000.

Iida, Takao; Shirahata, Kunikatsu; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, to Kyowa Hakko Kogyo Co., Ltd. Antibiotics XK-62-3 and XK-62-4 and process for production thereof. 4,310,661, Cl. 536-17.00R.

Iijima, Nobuo, to Fujitsu Limited. Electron beam irradiation apparatus. 4,310,764, Cl. 250-440.000.

Ikeda, Mituo, to Aisin Seiki Kabushiki Kaisha. Sliding caliper disc brake. 4,310,076, Cl. 188-73.350.

Ikemori, Keiji, to Canon Kabushiki Kaisha. Retro-focus type wide angle lens. 4,310,222, Cl. 350-432.000.

Ikkatai, Mitsuo: *See*—
Nozawa, Koji; Mizukoshi, Yukio; and Ikkatai, Mitsuo, 4,309,915, Cl. 74-339.000.

Illinois Tool Works Inc.: *See*—
Jorgensen, Arne R., 4,309,802, Cl. 29-90.00B.

Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, to Shin-Etsu Chemical Co., Ltd. Method for modifying surface properties in polyvinyl chloride shaped articles. 4,310,564, Cl. 427-40.000.

Imai, Masumi; Takato, Masao; and Tokuda, Hiroastu, to Hitachi, Ltd. Apparatus for electronically controlling internal combustion engine. 4,310,889, Cl. 364-431.040.

Imai, Masumi: *See*—
Furuhashi, Toshio; Tokuda, Hiroastu; Suda, Seiji; and Imai, Masumi, 4,310,888, Cl. 364-431.100.

Imamoto, Tsunehiko, to Dai Nippon Insatsu Kabushiki Kaisha. Method and apparatus for detecting the working state of a printing press or the like. 4,310,844, Cl. 346-1.100.

Imamura, Yasuo: *See*—
Kubota, Michio; Tsuda, Takeshi; Shimose, Masahiro; Takagi, Kazuhiro; Imamura, Yasuo; and Kato, Kazunori, 4,309,886, Cl. 72-202.000.

Imanishi, Kiyokazu: *See*—
Ichiyanagi, Takashi; Imanishi, Kiyokazu; Kawa, Hidetoshi; and Yamamoto, Katsuyuki, 4,310,130, Cl. 242-179.000.

Imbaud, Andre: *See*—
Ooms, Julius; Retureau, Bernard; and Imbaud, Andre, 4,310,479, Cl. 264-37.000.

Imperial Chemical Industries Limited: *See*—
Aitken, Robert M., 4,310,324, Cl. 86-1.00R.
Aitken, Robert M., 4,310,325, Cl. 86-1.00R.
Costain, Winston; Terry, Bernard W. H.; Punja, Nazim; and Cleare, Peter J. V., 4,310,464, Cl. 260-343.600.
Edge, Michael D., 4,310,544, Cl. 424-308.000.
Erskine, James B., 4,310,068, Cl. 181-290.000.
Langley, Phillip E., 4,310,712, Cl. 568-798.000.

Inagaki, Kazunori: *See*—
Yuuki, Hironori; Inagaki, Kazunori; Arai, Makoto; Baba, Noboru; Yamada, Matsuichi; and Kurihara, Hiroshi, 4,310,813, Cl. 333-117.000.

Inagaki, Yoshio: *See*—
Fujita, Shinsaku; Koyama, Koichi; and Inagaki, Yoshio, 4,310,693, Cl. 564-440.000.

Inagami, Masaaki: *See*—
Maeda, Akio; Hashimoto, Kinro; Inagami, Masaaki; and Fukushima, Hiroshi, 4,310,643, Cl. 525-468.000.

Inami, Yasuhiko: *See*—
Kuwagaki, Hiroshi; Kato, Hiroaki; Takechi, Sadatoshi; Nakauchi, Hiroshi; and Inami, Yasuhiko, 4,310,220, Cl. 350-357.000.

Inatomi, Haruo: *See*—
Funaki, Masaaki; Yoshida, Motoaki; Inatomi, Haruo; Kuriyama, Ryozo; and Oshima, Taizo, 4,310,330, Cl. 8-506.000.

Indian Head Inc.: *See*—
Pate, Harold T.; and Fochler, Helmut P., 4,309,855, Cl. 52-169.500.

Ingersoll-Rand Company: *See*—
Malsbury, Richard G.; and McGahan, Wallace A., 4,310,266, Cl. 405-259.000.

Inomata, Yoshizo: *See*—
Mitomo, Mamoru; Kuramoto, Nobuyuki; and Inomata, Yoshizo, 4,310,499, Cl. 423-327.000.

Inothume, Takasi: *See*—
Morita, Toru; Takahasi, Yasumasa; Akamathu, Kohei; and Inothume, Takasi, 4,310,819, Cl. 335-212.000.

Inoue, Ikutaro, to Alps Electric Co., Ltd. Printers. 4,310,256, Cl. 400-185.000.

Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,310,741, Cl. 219-69.00P.

Inoue, Kazuya, to Katsuragawa Electric Co., Ltd. System for controlling an original image scanning for use in slit exposure type image recording apparatus. 4,310,241, Cl. 355-60.000.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Storage-capacitor-type EDM power supply. 4,310,741, Cl. 219-69.00P.

Inoue, Noboru, to Takasago Medical Industry Co., Ltd. Apparatus for suturing a rectum. 4,310,115, Cl. 227-19.000.

Inoue, Teruo, to Toyo Rubber Industry Co., Ltd., The. Radial tire. 4,310,043, Cl. 152-356.00R.

Institut Francais du Petrole: *See*—
Arnaudeau, Marcel, 4,310,335, Cl. 55-46.000.
Deschamps, Andre; Dezael, Claude; Franckowiak, Sigismond; and Gruhier, Henri, 4,310,497, Cl. 423-230.000.
Mimoun, Hubert; Charpentier, Robert; and Roussel, Michel, 4,310,704, Cl. 568-385.000.
Rabilloud, Guy; and Sillion, Bernard, 4,310,699, Cl. 568-315.000.
Torck, Bernard; Convers, Alain; Asselineau, Lionel; and Hellin, Michel, 4,310,710, Cl. 568-697.000.

Institut Pasteur: *See*—
Fauve, Robert M., 4,310,513, Cl. 424-80.000.

Intercole Automation, Inc.: *See*—
Scharer, Hans R.; D'Amato, Dominic A.; Hold, Peter; and Hubner, Manfred, 4,310,251, Cl. 366-77.000.

International Business Machines Corporation: *See*—
Bohg, Armin; and Briska, Marian, 4,309,985, Cl. 126-422.000.
Brunsch, Arwed; Ruh, Wolf D.; Schneider, Jochen; and Trippel, Gerhard, 4,310,798, Cl. 324-209.000.
Clifton, Robert D.; and Phares, Richard F., 4,310,883, Cl. 364-200.000.
Edstrom, Gene H.; and Paulsen, Paul H., 4,310,895, Cl. 364-900.000.
Field, Thomas R.; and VanArsdall, Mary L., 4,310,257, Cl. 400-208.000.
Horng, Cheng T.; Schwenker, Robert O.; and Tsang, Paul J., 4,309,812, Cl. 29-578.000.

Howard, James K.; Rosenberg, William D.; and White, James F., 4,310,568, Cl. 427-84.000.
Hunter, Paul W.; and Malaccorto, Alexander E., 4,310,882, Cl. 364-200.000.
Korth, Hans-Erdmann; and Schedewie, Franz, 4,310,247, Cl. 356-365.000.
Lillie, James B.; and Sanford, James L., 4,310,868, Cl. 361-154.000.
Tsao, Chein-Hwa S., 4,310,845, Cl. 346-1.100.

International Computers Limited: *See—*
Broughton, Philip, 4,310,902, Cl. 365-218.000.

International Flavors & Fragrances Inc.: *See—*
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,310,681, Cl. 560-120.000.
Wilson, Richard A.; Mookherjee, Braja D.; Hall, John B.; and Stork, Gilbert, 4,310,701, Cl. 568-347.000.

International Harvester Company: *See—*
Khanna, Jagdish C.; and Kanas, William C., 4,310,061, Cl. 180-139.000.
Link, Erwin F.; and Schubert, William L., 4,310,062, Cl. 180-139.000.
Oliver, Robert J.; Lindblom, Kenneth J.; Idelman, Lloyd B.; and Medo, Carl S., 4,310,026, Cl. 137-637.000.
Shore, Daniel B., 4,310,078, Cl. 192-3.00S.

International Standard Electric Corporation: *See—*
Drake, Miles P., 4,309,810, Cl. 29-570.000.

Interox Chemicals Limited: *See—*
Curzons, Philip B., 4,310,332, Cl. 8-652.000.

Ionics Inc.: *See—*
MacDonald, Russell J., 4,310,631, Cl. 521-38.000.

Irioka, Kazuyoshi: *See—*
Tachita, Ryobun; Hayakawa, Yoshihiro; Fukukita, Hiroshi; Yano, Tsutomu; Irioka, Kazuyoshi; and Fukumoto, Akira, 4,310,907, Cl. 367-11.000.

Isenberg, Arnold O.; and Bradley, David F., to Westinghouse Electric Corp. Gas tight sealant for zirconia sensors. 4,310,402, Cl. 204-195.00S.

Ishida, Masamitsu: *See—*
Kato, Hisatoyo; Ishida, Masamitsu; and Matsumoto, Seiji, 4,310,886, Cl. 364-414.000.

Ishihara Sangyo Kaisha Ltd.: *See—*
Nishiyama, Ryuzo; Haga, Takahiro; Toki, Tadaaki; Koyanagi, Tohru; and Murai, Shigeo, 4,310,530, Cl. 424-263.000.

Ishii, Shinzo: *See—*
Iida, Takao; Shirahata, Kunikatsu; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,310,661, Cl. 536-17.00R.

Ishii, Tadashi, to Kobishi Electric Co., Ltd. Motor actuated bell. 4,310,834, Cl. 340-392.000.

Ishii, Toshitsugu: *See—*
Yamada, Mitsuhiro; Katayama, Hirokazu; Ishii, Toshitsugu; Makino, Yoshihiro; and Kamio, Masashi, 4,310,487, Cl. 422-68.000.

Ishii, Yasuaki: *See—*
Arai, Eisuke; Takagi, Fumio; Ishii, Yasuaki; and Kamei, Kuniaki, 4,310,370, Cl. 156-220.000.

Ishikawa, Tetsuo: *See—*
Yamagishi, Ryozo; Mita, Mamoru; Yoshioka, Osamu; and Ishikawa, Tetsuo, 4,309,959, Cl. 118-664.000.

Isogai, Tokio: *See—*
Oka, Hitoshi; Nakamura, Kenji; Yokono, Hitoshi; Isogai, Tokio; Matsuo, Akira; Miyazawa, Osamu; and Tanaka, Isamu, 4,310,563, Cl. 427-8.000.

Ito, Akio; and Ito, Masao, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Capillary nibs for inscribing instruments. 4,310,259, Cl. 401-265.000.

Ito, Masao: *See—*
Ito, Akio; and Ito, Masao, 4,310,259, Cl. 401-265.000.

Ito, Senji: *See—*
Katsura, Tadahiko; Suzuki, Kenji; and Ito, Senji, 4,310,578, Cl. 428-35.000.

Ito, Tomiyoshi: *See—*
Ozawa, Isao; Ito, Tomiyoshi; Hamada, Yoshiki; and Takeuchi, Isao, 4,310,682, Cl. 560-142.000.

Itoh, Isamu: *See—*
Onda, Shinzaburo; Okutsu, Eiichi; Itoh, Isamu; and Mifune, Hiroyuki, 4,310,622, Cl. 430-445.000.

ITT Industries, Inc.: *See—*
Bauer, Kurt; Hesch, Georg; Huber, Hans; Markert, Helmut; and Roth, Christian, 4,309,790, Cl. 15-250.420.
Belart, Juan, 4,309,935, Cl. 91-376.00R.
Volkmar, Werner; and Steffes, Helmut, 4,309,934, Cl. 91-373.000.

Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, to Nissan Motor Company Limited. Upshift scheduling valve for use in hydraulic transmission control system. 4,309,919, Cl. 74-869.000.

Iwasaki, Akira: *See—*
Motoyama, Shimesu; Yamada, Shuri; Kurita, Kaoru; and Iwasaki, Akira, 4,310,108, Cl. 222-396.000.

Iwasaki, Shingi: *See—*
Takinishi, Kiyotoshi; and Iwasaki, Shingi, 4,310,002, Cl. 128-642.000.

Iwata, Hiroshi, to West Electric Company, Ltd. Electronic photographic flash apparatus. 4,310,785, Cl. 315-241.00P.

Iwatani, Shiroh; and Morishita, Mitsuharu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor voltage regulator. 4,310,792, Cl. 322-28.000.

Iyengar, Rama, to Western Electric Company, Inc. Method and apparatus for generating a vapor stream. 4,310,474, Cl. 261-1.000.

J & L Machinery, Inc.: *See—*
Jacobson, Gerald D., 4,309,805, Cl. 29-429.000.

J. M. Voith GmbH: *See—*
Waldvogel, Hartmut, 4,309,960, Cl. 118-665.000.

Jaccard, Pierre-Ernest, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Light diffusing surface structure for a light guide in an information display. 4,310,219, Cl. 350-321.000.

Jacob Holm Varde A/S: *See—*
Balslev, Jorgen; and Madsen, Laust O., 4,310,478, Cl. 264-22.000.

Jacobi, Edgar F., Jr.; and Madden, Mark R. Fuel cell powered irrigation system. 4,309,874, Cl. 60-648.000.

Jacobs, Carol: *See—*
Anthon, Erik W.; and Jacobs, Carol, 4,310,784, Cl. 313-474.000.

Jacobson, Arnold: *See—*
Sherman, Kenneth N.; and Jacobson, Arnold, 4,310,510, Cl. 424-45.000.

Jacobson, Gerald D., to J & L Machinery, Inc. Carpet tack-strip installing method. 4,309,805, Cl. 29-429.000.

Jaeggi, Knut A.; Ostermayer, Franz; and Schroter, Herbert, to Ciba-Geigy Corporation. Etherified hydroxy quinazolone compounds. 4,310,527, Cl. 424-251.000.

Jager, Wolfgang, to Ebo-Jager, Inc. Temperature control device for aquarium heater. 4,310,822, Cl. 337-53.000.

Janome Sewing Machine Co., Ltd.: *See—*
Hanyu, Susumu; and Tonomura, Yoshinobu, 4,310,788, Cl. 318-551.000.

Janssen, Kermit W.; and Mitchell, Andrew, to Certain-Teed Corporation. Method of making a well screen. 4,310,372, Cl. 156-245.000.

Japan Atomic Energy Research Institute: *See—*
Kaetsu, Isao; Yoshida, Masaru; and Asano, Masaharu, 4,310,397, Cl. 204-159.220.

Japan Hydrazine Co., Inc.: *See—*
Hojo, Shiro; Hasegawa, Yoichi; and Nakagawa, Mineo, 4,310,696, Cl. 564-464.000.

Japan Spectroscopic Co., Ltd.: *See—*
Konishi, Hideki; Sugawara, Michiaki; and Saito, Muneo, 4,310,420, Cl. 210-659.000.

Jarvis, Roger P.; and Parsons, David, to Automotive Products Limited. Retarder for rotating members. 4,310,080, Cl. 192-4.00B.

Jenkins, Raymond F.; and Swift, Graham, to Tenneco Chemicals, Inc. Pigment dispersions containing copolymer of oxazolidinylalkyl or oxazolidinylalkoxyalkyl (meth)acrylate. 4,310,453, Cl. 260-42.540.

Jennings, Charles E., to PA Incorporated. Coating lance centralizer. 4,309,958, Cl. 118-306.000.

Jensen, Eric A.: *See—*
McCormack, Richard A.; and Jensen, Eric A., 4,309,980, Cl. 126-263.000.

Jensen, Keith E.: *See—*
Wolff, John S., III; Hemsworth, George R.; and Jensen, Keith E., 4,310,550, Cl. 424-365.000.

Jespersen, Knud; Buller-Colthurst, Guy E.; and Bergner, Hans L., to Knud Simonsen Industries Limited. Processing chamber with an air flow reverser. 4,310,020, Cl. 137-563.000.

Jeumont-Schneider: *See—*
Dumont, Alain G., 4,310,728, Cl. 179-18.0HB.

Johannesen, Donald D.; and Haluda, Raymond P., to Bendix Corporation, The. Disc brake. 4,310,075, Cl. 188-73.450.

John D. Hollingsworth On Wheels, Inc.: *See—*
Garrison, Joe K.; and Claycomb, Brian C., 4,309,796, Cl. 19-98.000.

Johnson, David A.: *See—*
Walker, Derek; Silvestri, Herbert H.; Sapino, Chester; and Johnson, David A., 4,310,458, Cl. 260-239.100.

Johnson & Johnson: *See—*
Gander, Robert J., 4,310,546, Cl. 424-311.000.

Johnson, Michael R.: *See—*
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,310,529, Cl. 424-263.000.
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,310,668, Cl. 546-204.000.
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,310,669, Cl. 546-206.000.

Johnson, Richard I.: *See—*
Connell, G. A. Neville; and Johnson, Richard I., 4,310,614, Cl. 430-271.000.

Johnston, Dean E.: *See—*
Condon, Charles E., Jr.; Johnston, Dean E.; and Shattuck, Charles W., 4,310,205, Cl. 308-135.000.

Johnston, George S. Self-supporting shrinking mandrel. 4,310,138, Cl. 249-180.000.

Johnston, J. L. Trash handling system. 4,310,279, Cl. 414-408.000.

Johnston, John R.: *See—*
Lichtenberger, W. Wayne; and Johnston, John R., 4,310,922, Cl. 370-48.000.

Jones, James R. Portable herbicide and insecticide applicator. 4,309,842, Cl. 47-1.500.

Jones, William R.; and Harrington, Edgar F., to National Identification Bureau, Inc. Apparatus identification system. 4,309,904, Cl. 73-597.000.

Jordco, Inc.: *See—*
Oien, Hal J., 4,310,308, Cl. 433-91.000.

Jorgensen, Arne R., to Illinois Tool Works Inc. Ring gear burnishing machine. 4,309,802, Cl. 29-90.00B.

Jory, Robert L. Visor for goggles and method of attachment. 4,309,775, Cl. 2-12.000.

Josam Lastbilteknik AB: *See—*
Samuelsson, Mokjas J., 4,309,895, Cl. 72-457.000.

Josef Meissner GmbH & Co.: *See*—
Langecker, Gerhard; Gebauer, Hans-Jurgen; and Hermann, Heinrich, 4,310,500, Cl. 423-345.000.

Joshi, David P., to Colgate Palmolive Company. Free flowing builder beads and detergents. 4,310,431, Cl. 252-91.000.

Jovanovics, Karola; and Gorog, Sandor, to Richter Gedeon Vegyeszeti Gyar Rt. Process for the preparation of bis-indole alkaloids and acid-addition salts thereof and methods of treating tumors with bis-indole alkaloids. 4,310,528, Cl. 424-262.000.

Joy Manufacturing Company: *See*—
Peterson, Harley G., 4,310,336, Cl. 55-377.000.

JPX; Takahashi, Keiichi; Aoyama, Hiroshi; Hirakawa, Kikuya; and Sarusawa, Yukio, to Tokan Kogyo Co., Ltd. Process for making a container cover member having synthetic resin openable portion. 4,309,952, Cl. 413-12.000.

Judd, Douglas K., to Crane Enfield Metals Pty. Limited. Production of copper tubing. 4,309,887, Cl. 72-280.000.

Jung, Johann: *See*—
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,310,345, Cl. 71-76.000.

Jungheinrich Unternehmensverwaltung KG: *See*—
Mank, Klaus-Dieter; and Prommel, Gunther, 4,310,789, Cl. 318-587.000.

Jurak, Ferenc: *See*—
Budai, Zoltan; Jurak, Ferenc; Kis-tamas, Attila; Lay nee Konya, Aranka; Mezei, Tibor; Vig, Zoltan; and Zubovits nee Kristof, Terez, 4,310,348, Cl. 71-121.000.

Juso, Hiromi; Tsuji, Shigeki; and Maeda, Shigemi, to Sharp Kabushiki Kaisha. Instruction controlled audio visual system. 4,310,838, Cl. 340-701.000.

Kabushiki Kaisha Meidensha: *See*—
Sakuma, Shinzo; and Warabi, Junichi, 4,310,735, Cl. 200-144.00B.

Kabushiki Kaisha Seikosha: *See*—
Fujita, Masanori, 4,310,909, Cl. 368-240.000.

Kabushikikaisha Nakazima: *See*—
Nakazima, Norio, 4,310,740, Cl. 219-61.110.

Kaetsu, Isao; Yoshida, Masaru; and Asano, Masaharu, to Japan Atomic Energy Research Institute. Polymer composition containing a physiologically active substance. 4,310,397, Cl. 204-159.220.

Kah, Carl L. C., Jr. Magnetically actuated pilot valve. 4,310,023, Cl. 137-625.500.

Kahan, Hillard M.; Acebo, William F.; and Stafford, Michael K., to Ampex Corporation. Highly orientable iron particles. 4,310,349, Cl. 75-0.50R.

Kaibel, Gerd: *See*—
Nissen, Axel; Kaibel, Gerd; Woerz, Otto; Arnold, Lothar; Braun, Manfred; and Rebafka, Walter, 4,310,705, Cl. 568-391.000.

Kaji, Takeo: *See*—
Kikuchi, Masahiro; Okada, Hitoshi; Ihashi, Takao; and Kaji, Takeo, 4,310,912, Cl. 369-43.000.

Kakimoto, Kenichi: *See*—
Ehashi, Shigeyuki; Tsuchida, Junichi; Kakimoto, Kenichi; and Katsura, Hiromitsu, 4,310,359, Cl. 106-288.00Q.

Kalamazoo Incorporated Technology: *See*—
McLain, Donald E., 4,309,924, Cl. 81-159.000.

Kalvinskas, John J.; Hsu, George C.; and Ernest, John B., to California Institute of Technology. Crude oil desulfurization. 4,310,049, Cl. 166-267.000.

Kamachi, Shinichi: *See*—
Kaneko, Nobutaka; and Kamachi, Shinichi, 4,310,407, Cl. 204-299.00R.

Kamei, Kuniaki: *See*—
Arai, Eisuke; Takagi, Fumio; Ishii, Yasuaki; and Kamei, Kuniaki, 4,310,370, Cl. 156-220.000.

Kamino, Yukishige: *See*—
Sakamoto, Masakatsu; Uchida, Kenji; Kamino, Yukishige; and Saito, Makoto, 4,310,491, Cl. 422-234.000.

Kamio, Masashi: *See*—
Yamada, Mitsuhiro; Katayama, Hirokazu; Ishii, Toshitsugu; Makino, Yoshihiro; and Kamio, Masashi, 4,310,487, Cl. 422-68.000.

Kanas, William C.: *See*—
Khanna, Jagdish C.; and Kanas, William C., 4,310,061, Cl. 180-139.000.

Kanegafuchi Chemical Industry Co., Ltd.: *See*—
Hasegawa, Junzo; Ogura, Masahiro; Hamaguchi, Shigeki; Shimazaki, Masami; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,310,635, Cl. 435-146.000.

Kanegafuchi Kogaku Kogyo Kabushiki Kaisha: *See*—
Kato, Yasushi; Furukawa, Hisao; Matsumura, Shoichi; and Nakatsuka, Saori, 4,310,640, Cl. 525-100.000.

Kaneko, Nobutaka; and Kamachi, Shinichi, to Olympus Optical Co., Ltd. Electrophoretic apparatus. 4,310,407, Cl. 204-299.00R.

Kano, Tetsuzo: *See*—
Nomura, Shigenori; and Kano, Tetsuzo, 4,310,317, Cl. 434-319.000.

Kaplan, Mikhail D.: *See*—
Maizenberg, Mikhail I.; Kaplan, Mikhail D.; Veremeenko, Stanislav V.; Bobrov, Vladimir T.; Moshkovich, Vladimir U.; Shapovalov, Petr F.; Troitsky, Vladimiru A.; Zhukovsky, Petr G.; and Komsky, Igor B., 4,309,905, Cl. 73-601.000.

Kappes, Randall J.: *See*—
Brager, Douglas R.; and Kappes, Randall J., 4,309,788, Cl. 15-53.00A.

Karalis, Anastasios J.: *See*—
Longley, Kermit D.; and Karalis, Anastasios J., 4,310,683, Cl. 560-151.000.

Karau, Philip A.: *See*—
Sheldrake, Leonard J.; Olson, Stanley E.; and Karau, Philip A., 4,310,793, Cl. 322-28.000.

Karlotski, Robert J.; and Work, Dale E., to GTE Products Corporation. Arc discharge lamp containing scandium and scandium halide. 4,310,774, Cl. 313-228.000.

Karmakov, Encho Y.: *See*—
D'Angiolillo; Karmakov, Encho Y.; Shakrachki, Kiril T.; Shakrachki, Metodi T.; Stoyanov, Stoyan H.; Vassileva, Todorka N.; and Trifonov, Todor P., 4,310,254, Cl. 400-109.000.

Karol, James J., to Bendix Corporation, The. Pin and socket terminals for fiber optic cables. 4,310,218, Cl. 350-96.210.

Karpisek, Ladislav S. Method and apparatus to stretch wrap an object in plastic film. 4,309,861, Cl. 53-556.000.

Kashio, Toshio, to Casio Computer Co., Ltd. Data-recording device. 4,310,861, Cl. 360-50.000.

Katayama, Hirokazu: *See*—
Yamada, Mitsuhiro; Katayama, Hirokazu; Ishii, Toshitsugu; Makino, Yoshihiro; and Kamio, Masashi, 4,310,487, Cl. 422-68.000.

Katayama, Hitoshi, to Shimano Industrial Company Limited. Fixing device for fixing a handle stem to a front fork at a bicycle. 4,310,260, Cl. 403-7.000.

Kato, Hiroaki: *See*—
Kuwagaki, Hiroshi; Kato, Hiroaki; Takechi, Sadatoshi; Nakauchi, Hiroshi; and Inami, Yasuhiko, 4,310,220, Cl. 350-357.000.

Kato, Hisatoyo; Ishida, Masamitsu; and Matsumoto, Seiji, to Fuji Photo Film, Co. Ltd. Image gradation processing method and apparatus for radiation image recording system. 4,310,886, Cl. 364-414.000.

Kato, Kazunori: *See*—
Kubota, Michio; Tsuda, Takeshi; Shimose, Masahiro; Takagi, Kazuhiro; Imamura, Yasuo; and Kato, Kazunori, 4,309,886, Cl. 72-202.000.

Kato, Tadaaki. Cultivating device for plants. 4,309,843, Cl. 47-18.000.

Kato, Yasushi; Furukawa, Hisao; Matsumura, Shoichi; and Nakatsuka, Saori, to Kanegafuchi Kogaku Kogyo Kabushiki Kaisha. Curable composition. 4,310,640, Cl. 525-100.000.

Katoh, Shigeo: *See*—
Sada, Eizo; Katoh, Shigeo; Toei, Ryozo; and Michiki, Hideyuki, 4,310,253, Cl. 366-273.000.

Katsura, Hiromitsu: *See*—
Ehashi, Shigeyuki; Tsuchida, Junichi; Kakimoto, Kenichi; and Katsura, Hiromitsu, 4,310,359, Cl. 106-288.00Q.

Katsura, Tadahiko; Suzuki, Kenji; and Ito, Senji, to Toyo Seikan Kaisha Limited. Retort-sterilizable laminated structure and process for preparation thereof. 4,310,578, Cl. 428-35.000.

Katsuragawa Electric Co., Ltd.: *See*—
Inoue, Kazuya, 4,310,241, Cl. 355-60.000.

Kauffman, Peter T. Exercising device for the fingers, wrist and forearm. 4,310,154, Cl. 272-67.000.

Kaufman, Arthur: *See*—
Early, Jack; Kaufman, Arthur; and Stawsky, Alfred, 4,310,605, Cl. 429-18.000.

Kaupert, Guenther. Method and apparatus for the forming of a series of troughs into a metal foil strip. 4,309,889, Cl. 72-356.000.

Kawa, Hidetoshi: *See*—
Ichiyanagi, Takashi; Imanishi, Kiyokazu; Kawa, Hidetoshi; and Yamamoto, Katsuyuki, 4,310,130, Cl. 242-179.000.

Kawaharada, Hajime: *See*—
Hasegawa, Junzo; Ogura, Masahiro; Hamaguchi, Shigeki; Shimazaki, Masami; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,310,635, Cl. 435-146.000.

Kawaharazaki, Takashi: *See*—
Morita, Masayuki; Kawaharazaki, Takashi; and Shimogawa, Toshiaki, 4,310,128, Cl. 242-107.000.

Kawasaki, Syozo: *See*—
Nakanishi, Masae; Nakamura, Kiyoshi; and Kawasaki, Syozo, 4,310,492, Cl. 422-246.000.

Kawasaki, Teruo: *See*—
Tsunoda, Masakazu; and Kawasaki, Teruo, 4,310,825, Cl. 340-52.00F.

Kay, Leslie. Method of and apparatus for providing information as to the existence or position of objects. 4,310,903, Cl. 367-102.000.

Kayama, Naohiro: *See*—
Uegai, Yoshiaki; Watanabe, Tsuyoshi; Shiota, Masashi; Okumoto, Itsuo; and Kayama, Naohiro, 4,310,533, Cl. 424-267.000.

Kayman, Arnold I., to Chromalloy Electronics Corporation. Radial horn. 4,310,065, Cl. 181-159.000.

Kazarian, Adam, Jr. Multi-purpose automobile brake anti-creep device. 4,310,064, Cl. 180-271.000.

Keener, Harold M.; and Sciarini, Michael J., to Ohio Agricultural Research and Development Center. Demand load control. 4,310,770, Cl. 307-35.000.

Keil, Karl-Heinz: *See*—
Dorries, Peter; and Keil, Karl-Heinz, 4,310,355, Cl. 106-2.000.

Keithler, William R.: *See*—
Bradley, Robert E.; and Keithler, William R., 4,310,390, Cl. 204-37.00R.

Keller, Ronald P.; and Keller, William G. Anterior tooth prosthesis. 4,310,312, Cl. 433-204.000.

Keller, William G.: *See*—
Keller, Ronald P.; and Keller, William G., 4,310,312, Cl. 433-204.000.

Kelley, Clair S., to United States of America, Army. Tactical nuclear slide rule for a plurality of environments. 4,310,750, Cl. 235-70.00A.

Kelley, Lawrence R., to United States of America, Air Force. Stable ultraviolet chemical filter. 4,310,215, Cl. 350-1.500.

Kelly, James G.: *See—*
Hibbitts, Charles H.; Price, Byron F.; Cogbill, Everett C.; Kelly, James G.; and Glass, James E., 4,310,006, Cl. 131-290.000.
KemaNord AB: *See—*
Sjolin, Karen, 4,310,649, Cl. 526-212.000.
Kempter, Fritz E.; Schupp, Eberhard; Schenck, Hans-Uwe; and Gulbins, Erich, to BASF Aktiengesellschaft. Polyadducts of ammonia and epoxide compounds, processes for their modification, and their use. 4,310,645, Cl. 525-526.000.
Kempter, Fritz E.; and Schupp, Eberhard, to BASF Aktiengesellschaft. Self-crosslinking cationic binders and their preparation. 4,310,646, Cl. 525-528.000.
Kennedy, Edmund E., to General Aviation Electronics, Inc. Two-way transceiver including frequency synthesizer. 4,310,923, Cl. 455-79.000.
Kennedy, John H., to Patriark, Inc. Method and apparatus for increasing the fluid throughput of a conduit. 4,310,028, Cl. 138-39.000.
Kenney, Charlie W.: *See—*
Ruskan, Richard P.; Zafar, Humayon Z.; Goens, Duane N.; Hyatt, David E.; and Kenney, Charlie W., 4,310,490, Cl. 422-188.000.
Kentosh, James M., to Amtel, Inc. Riser-to-vessel-mooring-terminal. 4,309,955, Cl. 114-230.000.
Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung: *See—*
Fremerey, Johan K., 4,310,795, Cl. 324-78.00D.
Seeger, Arnold; Schalt, Wilfried; and Rabiger, Jurgen, 4,310,787, Cl. 318-85.000.
Kerr, Edwin R.: *See—*
Dorawala, Tansukhlal G.; Reinhard, Russell R.; and Kerr, Edwin R., 4,310,715, Cl. 585-487.000.
Ketterer, Edward A., to Heil-Quaker Corporation. Mounting arrangement for condensate neutralizer in a furnace. 4,309,947, Cl. 110-203.000.
Key, Morris D.; and Crawford, William H., Jr., to Halabs, Incorporated. Inhibited oil field drilling fluid. 4,310,425, Cl. 252-8.50A.
Khanna, Jagdish C.; and Kanas, William C., to International Harvester Company. Steering geometry for articulated farm tractor. 4,310,061, Cl. 180-139.000.
Khayat, Ali; and Redenz, Klaus P., to Ralston Purina Company. Method of increasing the corrosion resistance of enamel coated steel. 4,310,575, Cl. 427-409.000.
Kia, Mansor; and Hanley, Harold G., to Motorola, Inc. Chassis captivation arrangement for an electronic device. 4,310,870, Cl. 361-415.000.
Kibler, Robert L., to Lambert Brake Corporation. Brake leveling and positioning structure. 4,310,074, Cl. 188-72.900.
Kiener, Paul: *See—*
Cheminal, Bernard; Kiener, Paul; and Traversaz, Aime, 4,310,697, Cl. 564-479.000.
Kikuchi, Hideo, to Ricoh Company, Ltd. Electrostatographic apparatus comprising sheet sensors. 4,310,153, Cl. 271-259.000.
Kikuchi, Masahiro; Okada, Hitoshi; Ihashi, Takao; and Kaji, Takeo, to Sony Corporation. Servo system for recording and/or reproducing apparatus using a rotatable recording carrier. 4,310,912, Cl. 369-43.000.
Kikumoto, Ryoji; Tobe, Akihiro; Fukami, Harukazu; Egawa, Mitsuo; and Ninomiya, Kunihiro, to Mitsubishi Chemical Industries Limited. Pharmaceutically active 2-(4-aminobutoxy)stilbenes. 4,310,534, Cl. 424-267.000.
Kilbourn, Edward E.; and Weir, W. David, to Rohm and Haas Company. Acetyl- and carbalkoxythioureidobenzophenones. 4,310,537, Cl. 424-300.000.
Kimble, Victor W., to Milliken Research Corporation. Apparatus for the application of liquids to moving materials. 4,309,881, Cl. 68-205.00R.
Kimura, Muneaki: *See—*
Ohmura, Kaoru; Shibasaki, Ichiro; Kimura, Takeo; and Kimura, Muneaki, 4,310,641, Cl. 525-419.000.
Kimura, Takeo: *See—*
Ohmura, Kaoru; Shibasaki, Ichiro; Kimura, Takeo; and Kimura, Muneaki, 4,310,641, Cl. 525-419.000.
Kimura, Taro: *See—*
Mochizuki, Manabu; Miyakawa, Seiichi; Kimura, Taro; and Hashimoto, Junichiro, 4,310,238, Cl. 355-14.00D.
King, David A.; and Vallans, Sidney J., to Caligen Foam Limited. Production of artificial growing mediums. 4,309,844, Cl. 47-56.000.
King-Seeley Thermos Company: *See—*
Beaupre, Peter M., 4,310,587, Cl. 428-246.000.
Kinsho, Yoshio: *See—*
Tamaru, Akio; Kinsho, Yoshio; and Yoshida, Takayuki, 4,310,703, Cl. 568-361.000.
Kirrish, Hail, to Textron Inc. Fastener assembly. 4,310,273, Cl. 411-338.000.
Kis-tamas, Attila: *See—*
Budai, Zoltan; Jurak, Ferenc; Kis-tamas, Attila; Lay nee Konya, Aranka; Mezei, Tibor; Vig, Zoltan; and Zubovits nee Kristof, Terez, 4,310,348, Cl. 71-121.000.
Kisida, Ichihei; Kobayashi, Takashi; and Matsushita, Masahisa, to C. I. Kasei Co. Ltd. Packaging bags for powdery materials. 4,310,118, Cl. 229-62.500.
Kitabayashi, Seiichi. Gas lighter. 4,310,297, Cl. 431-254.000.
Kitagawa, Kiyoshi: *See—*
Satoh, Hiroaki; Kokubu, Yoshikazu; Kitagawa, Kiyoshi; and Okazaki, Isao, 4,310,404, Cl. 204-252.000.
Kitagishi, Nozomu: *See—*
Konishi, Yuichiro; Kitagishi, Nozomu; and Sumi, Akiyasu, 4,310,231, Cl. 354-79.000.
Kitchen, John A. Pulse combustion apparatus. 4,309,977, Cl. 126-99.00A.
Kjelgaard, William L.; and Anderson, Paul M., to Research Corporation. Method and apparatus for the adiabatic expansion of liquid anhydrous ammonia. 4,310,344, Cl. 71-61.000.
Kjelgaard, William L.; and Anderson, Paul M., to Research Corporation. Method and apparatus for the adiabatic expansion of liquid anhydrous ammonia. 4,310,555, Cl. 426-69.000.
Klabunde, Edwin C.: *See—*
Gaus, Frank D.; and Klabunde, Edwin C., 4,310,446, Cl. 260-28.5AS.
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., to International Flavors & Fragrances Inc. Carboalkoxy alkyl norbornane derivatives and process for preparing same. 4,310,681, Cl. 560-120.000.
Kline, Richard H., to General Motors Corporation. Method for manufacturing a preformed flex-rib battery case. 4,309,818, Cl. 29-623.100.
Klockner-Humboldt-Deutz AG: *See—*
Abelitis, Andris, 4,310,298, Cl. 432-14.000.
Klomp, Edward D., to General Motors Corporation. Eccentric, oscillating intake valve. 4,309,966, Cl. 123-90.280.
Knapp, Michael, to Eastern Metal of Elmira, Inc. Wind deflectable sign holder. 4,309,836, Cl. 40-602.000.
Knight, Leland W., to Reichert, Paul W. Personal urinal device useable by males and females. 4,309,779, Cl. 4-144.300.
Knud Simonsen Industries Limited: *See—*
Jespersen, Knud; Buller-Colthurst, Guy E.; and Bergner, Hans L., 4,310,020, Cl. 137-563.000.
Kobayashi, Mituo: *See—*
Yokoe, Masaaki; and Kobayashi, Mituo, 4,309,809, Cl. 29-568.000.
Kobayashi, Takashi: *See—*
Kisida, Ichihei; Kobayashi, Takashi; and Matsushita, Masahisa, 4,310,118, Cl. 229-62.500.
Kobayashi, Toyohiko: *See—*
Sawano, Kiyohito; Kobayashi, Toyohiko; and Tsuruta, Haruki, 4,310,685, Cl. 560-204.000.
Kobe, Inc.: *See—*
Erickson, John W., 4,310,288, Cl. 417-54.000.
Kobishi America, Inc.: *See—*
Sakaguchi, Mitsuo, 4,310,833, Cl. 340-384.00E.
Kobishi Electric Co., Ltd.: *See—*
Ishii, Tadashi, 4,310,834, Cl. 340-392.000.
Koehne, Bruno: *See—*
Patel, Dilip C.; Stricklin, John D.; and Koehne, Bruno, 4,310,864, Cl. 360-97.000.
Kohl, Albert: *See—*
Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Kohl, Albert; Spoor, Herbert; Mahler, Karl; and Balz, Werner, 4,310,565, Cl. 427-48.000.
Kohl, Lambert; Boehm, Udo; and Schulze-Berge, Klaus, to BASF Aktiengesellschaft. Cable positioner for a scanning head. 4,310,865, Cl. 360-106.000.
Kohl, Paul A., to Bell Telephone Laboratories, Incorporated. Electrolytic plating. 4,310,392, Cl. 204-52.00R.
Kohlhepp, Heinrich. Wall clothes hanger. 4,310,096, Cl. 211-88.000.
Kohn, Gary A., to Otis Engineering Corporation. Safety valve. 4,310,019, Cl. 137-553.000.
Kohshoh Limited: *See—*
Noda, Taizo, 4,309,799, Cl. 24-315.000.
Kokubu, Yoshikazu: *See—*
Satoh, Hiroaki; Kokubu, Yoshikazu; Kitagawa, Kiyoshi; and Okazaki, Isao, 4,310,404, Cl. 204-252.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Yuuki, Hironori; Inagaki, Kazunori; Arai, Makoto; Baba, Noboru; Yamada, Matsuichi; and Kurihara, Hiroshi, 4,310,813, Cl. 333-117.000.
Kolacz, Ferdynand, to Allis-Chalmers Corporation. Park lock and range shift control. 4,310,081, Cl. 192-4.00A.
Kolb, Fritz; Ziegert, Otto; and Fehlisch, Silvan, to Bayer Aktiengesellschaft. Method of reducing noise during throttling of vapor and gas streams. 4,310,069, Cl. 181-296.000.
Kolleas, Pete D. Adjustable footrest for vehicles. 4,310,193, Cl. 296-75.000.
Kollmorgen Technologies Corporation: *See—*
Mulet-Marquis, Yves, 4,310,790, Cl. 318-608.000.
Kolts, John H.: *See—*
Eastman, Alan D.; and Kolts, John H., 4,310,717, Cl. 585-661.000.
Komsky, Igor B.: *See—*
Maizenberg, Mikhail I.; Kaplan, Mikhail D.; Veremeenko, Stanislav V.; Bobrov, Vladimir T.; Moshkovich, Vladimir U.; Shapovalov, Petr F.; Troitsky, Vladimiru A.; Zhukovsky, Petr G.; and Komsky, Igor B., 4,309,905, Cl. 73-601.000.
Kondo, Kazuo: *See—*
Takami, Akio; and Kondo, Kazuo, 4,310,598, Cl. 428-406.000.
Kondo, Mitsuru: *See—*
Takahashi, Shuichi; and Kondo, Mitsuru, 4,310,859, Cl. 358-304.000.
Konishi, Hideki; Sugawara, Michiaki; and Saito, Muneo, to Japan Spectroscopic Co., Ltd. Mobile phase supplying method in the liquid chromatography and apparatus therefor. 4,310,420, Cl. 210-659.000.
Konishi, Yuichiro; Kitagishi, Nozomu; and Sumi, Akiyasu, to Canon Kabushiki Kaisha. Close-up copy photography apparatus. 4,310,231, Cl. 354-79.000.

Konkal, John J.: *See*—
Mottershead, Frank R.; Konkal, John J.; and Gerlach, Charles G., 4,309,925, Cl. 82-12.000.

Koppers Company, Inc.: *See*—
Brennan, Earl D., 4,309,878, Cl. 62-542.000.

Koran, Kenneth W.; and Parry, William T., to General Electric Company. Method and flow system for the control of turbine temperatures during bypass operation. 4,309,873, Cl. 60-646.000.

Kornrumpf, William P.; and Harnden, John D., Jr., to General Electric Company. Electrical device termination high temperature indicator. 4,310,837, Cl. 340-598.000.

Korth, Hans-Erdmann; and Schedewie, Franz, to International Business Machines Corporation. Method and apparatus for analyzing the state of polarization of radiation. 4,310,247, Cl. 356-365.000.

Kotzsch, Hans-Joachim; Amort, Jurgen; and Vahlensieck, Hans-Joachim, to Dynamit Nobel AG. Method of cleaving siloxanes. 4,310,680, Cl. 556-467.000.

Kowalski, Melvin; and Stefanelli, E. N., to Teledyne Industries, Inc. Workpiece holder. 4,309,849, Cl. 51-237.00R.

Koyama, Koichi: *See*—
Fujita, Shinsaku; Koyama, Koichi; and Inagaki, Yoshio, 4,310,693, Cl. 564-440.000.

Koyanagi, Tohru: *See*—
Nishiyama, Ryuzo; Haga, Takahiro; Toki, Tadaaki; Koyanagi, Tohru; and Murai, Shigeo, 4,310,530, Cl. 424-263.000.

Kraftco Corporation: *See*—
Miller, Roland E.; Scaletta, Joseph A.; and Valek, John, 4,309,888, Cl. 72-334.000.

Krajewski, John J.; and Murphy, Edward J., to DeSoto, Inc. Production of monomeric etherified bisphenol-formaldehyde condensates. 4,310,653, Cl. 528-143.000.

Kramer, Donald L., to Miles Laboratories, Inc. Spectrophotometer. 4,310,249, Cl. 356-414.000.

Kramer, Horst: *See*—
Dantlgraber, Jorg; Gossl, Dietmar; and Kramer, Horst, 4,310,290, Cl. 417-273.000.

Krapcho, John; and Wade, Peter C., to E. R. Squibb & Sons, Inc. Imido, amido and amino derivatives of mercaptoacyl prolines and pipecolic acids. 4,310,461, Cl. 260-326.200.

Kraus, Siegfried, to Cross Company, The. Feed unit. 4,310,270, Cl. 408-234.000.

Kreft, Keith A.; Rossetti, Alan E.; and Lynn, Michael F., to Sun Electric Corporation. Apparatus for measurement and display of relative compression by cylinder. 4,309,900, Cl. 73-117.200.

Kreuter, Walter: *See*—
Wernicke, Hans J.; Kreuter, Walter; and Schliebener, Claus, 4,310,409, Cl. 208-57.000.

Krisner, James F.: *See*—
Guest, Neil A.; and Krisner, James F., 4,309,870, Cl. 60-39.080.

Krueger, Wallace F.: *See*—
Shaw, Anthony R.; Krueger, Wallace F.; and Bastian, Lloyd E., 4,310,116, Cl. 228-183.000.

Krumpfer, Mary Belle, executrix: *See*—
Kumpfer, Beverly D., deceased; and Krumpfer, Mary Belle, executrix, 4,310,786, Cl. 315-39.510.

Krzyminski, Harald. Reproduction camera apparatus. 4,310,239, Cl. 355-18.000.

Kubota, Michio; Tsuda, Takeshi; Shimose, Masahiro; Takagi, Kazuhiro; Imamura, Yasuo; and Kato, Kazunori, to Nisshin Steel Co., Ltd.; and Dai Nippon Printing Co., Ltd. Process for producing steel strip material for use in manufacture of shadow mask of Braun tube for color TV. 4,309,886, Cl. 72-202.000.

Kuchuk-Yatsenko, Sergei I.: *See*—
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Miroshnichenko, Alexandr P., 4,310,737, Cl. 219-59.100.

Kulesza, Ralph J.; and Disko, Harry, to Marvin Glass & Associates. Inflatable top. 4,309,840, Cl. 46-68.000.

Kulesza, Ralph J.; Wildman, John R.; and Meyer, Burton C., to Marvin Glass & Associates. Round-about game. 4,310,156, Cl. 273-1.0GE.

Kummer, Rudolf; Schneider, Heinz-Walter; Taglieber, Volker; and Weiss, Franz-Josef, to BASF Aktiengesellschaft. Preparation of butanedicarboxylic esters. 4,310,686, Cl. 560-204.000.

Kumpfer, Beverly D., deceased; and Krumpfer, Mary Belle, executrix. Magnetron tube with improved low cost structure. 4,310,786, Cl. 315-39.510.

Kunimoto, Go; Ichinose, Isao; Suzuki, Noboru; and Mori, Fumio, to Toyo Seikan Kaisha Ltd. Container cap having a peelable liner. 4,310,100, Cl. 215-228.000.

Kunkler, Hans: *See*—
Hilbig, Josef; Holst, Arno; Kunkler, Hans; Stolting, Klaus; and Schminke, Wolfgang, 4,310,663, Cl. 536-91.000.

Kuramoto, Nobuyuki: *See*—
Mitomo, Mamoru; Kuramoto, Nobuyuki; and Inomata, Yoshizo, 4,310,499, Cl. 423-327.000.

Kuraray Company, Limited: *See*—
Tanaka, Yoshinobu; Ogawa, Koichi; and Hioka, Minoru, 4,310,416, Cl. 210-321.300.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Satoh, Hiroaki; Kokubu, Yoshikazu; Kitagawa, Kiyoshi; and Okazaki, Isao, 4,310,404, Cl. 204-252.000.

Kurihara, Hiroshi; and Takenaka, Sadao. Bandpass filter circuit. 4,310,803, Cl. 328-167.000.

Kurihara, Hiroshi: *See*—
Yuuki, Hironori; Inagaki, Kazunori; Arai, Makoto; Baba, Noboru; Yamada, Matsuichi; and Kurihara, Hiroshi, 4,310,813, Cl. 333-117.000.

Kurita, Kaoru: *See*—
Motoyama, Shimesu; Yamada, Shuri; Kurita, Kaoru; and Iwasaki, Akira, 4,310,108, Cl. 222-396.000.

Kuriyama, Ryozo: *See*—
Funaki, Masaaki; Yoshida, Motoaki; Inatomi, Haruo; Kuriyama, Ryozo; and Oshima, Taizo, 4,310,330, Cl. 8-506.000.

Kurosaki Refractories Co., Ltd.: *See*—
Fujimoto, Shyoichiro; and Ueno, Haruyuki, 4,310,480, Cl. 264-56.000.

Kurti, Marianna: *See*—
Hajos, Andor; Fekete, Marton; Kurti, Marianna; Lang, Tibor; Toldy, Lajos; Borvendeg, Janos; Nagy, Laszlo; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,310,549, Cl. 424-330.000.

Kusters, Eduard: *See*—
Kutz, Johannes; and Moser, Manfred, 4,310,113, Cl. 226-4.000.

Kutz, Johannes; and Moser, Manfred, to Kusters, Eduard. Apparatus and method for storage and reaction treatment of textile material in web form. 4,310,113, Cl. 226-4.000.

Kuwagaki, Hiroshi; Kato, Hiroaki; Takechi, Sadatoshi; Nakauchi, Hiroshi; and Inami, Yasuhiko, to Sharp Kabushiki Kaisha. Electrochromic display with one porous separator. 4,310,220, Cl. 350-357.000.

Kvant, Magnus B., to Supra Aktiebolag. Method for producing pigment for use in sizing compositions. 4,310,360, Cl. 106-306.000.

Kwikform Limited: *See*—
Lovering, Dennis W., 4,309,857, Cl. 52-632.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Iida, Takao; Shirahata, Kunikatsu; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,310,661, Cl. 536-17.00R.

L. & C. Steinmuller GmbH: *See*—
Michalak, Stanislaw, 4,310,046, Cl. 165-5.000.

Laborde, Alice L.: *See*—
Dolak, Lester A.; Laborde, Alice L.; and Castle, Thomas M., 4,310,627, Cl. 435-84.000.

LaFlame, Frank E., to General Motors Corporation. Electro-viscous fan clutch. 4,310,085, Cl. 192-58.00B.

Lahman, John W.: *See*—
Loy, Jeffrey A.; Goetsch, Albert H.; and Lahman, John W., 4,310,187, Cl. 292-56.000.

Lai, John T., to B. F. Goodrich Company, The. Stabilized polymers, novel stabilizers, and synthesis thereof. 4,310,429, Cl. 252-51.50A.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Malafosse, Jean; and Rignon, Maurice, 4,310,394, Cl. 204-82.000.

Lalli, Mary S. Hair roller. 4,310,008, Cl. 132-40.000.

Lambert Brake Corporation: *See*—
Kibler, Robert L., 4,310,074, Cl. 188-72.900.

Lang, Tibor: *See*—
Hajos, Andor; Fekete, Marton; Kurti, Marianna; Lang, Tibor; Toldy, Lajos; Borvendeg, Janos; Nagy, Laszlo; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,310,549, Cl. 424-330.000.

Langecker, Gerhard; Gebauer, Hans-Jurgen; and Hermann, Heinrich, to Josef Meissner GmbH & Co. Method for removing volatile aromatic compounds. 4,310,500, Cl. 423-345.000.

Langer, Arthur W., to Exxon Research & Engineering Co. Novel trialkyl aluminum cocatalyst. 4,310,439, Cl. 252-429.00B.

Langley, Phillip E., to Imperial Chemical Industries Limited. Process for the production of phenol and acetone. 4,310,712, Cl. 568-798.000.

Lanik, Hans, to EVVA-Werk Spezialerzeugung von Zylinder- und Sicherheitsschlossern Gesellschaft m.b.H. & Co. Kommanditgesellschaft. Magnetizing device. 4,310,820, Cl. 335-284.000.

Lantzsch, Reinhard; Marhold, Albrecht; Behrenz, Wolfgang; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Combating arthropods with novel benzyl esters. 4,310,540, Cl. 424-282.000.

Lapohn, Gerhard. Methods and apparatuses for assembling washer members with fastener members. 4,309,787, Cl. 10-155.00A.

Larkins, Rodney J.: *See*—
Steelman, Ronald S.; and Larkins, Rodney J., 4,310,615, Cl. 430-271.000.

Larsen, Gregory J.; and Easter, William M., to FMC Corporation. Citrus fruit juice extractor. 4,309,943, Cl. 99-509.000.

Larsen, Gregory J.: *See*—
Frost, Elmer F., Jr.; and Larsen, Gregory J., 4,309,944, Cl. 100-104.000.

Larson, Marlow W. Adjustable sighting device for archery bows. 4,309,827, Cl. 33-265.000.

LaSalle, LeRoy: *See*—
Teague, J. T., 4,310,283, Cl. 414-786.000.

Laub, Bernard: *See*—
Rolinski, Edmund J.; and Laub, Bernard, 4,309,901, Cl. 73-147.000.

Laurent, Malchair. Pick-up for measuring forces or weight loads. 4,309,896, Cl. 73-1.00B.

Lauve, Henry de S., to Electric Fuel Propulsion Corp. Automobile front end unit. 4,310,872, Cl. 362-82.000.

Lavallee, Michael H.: *See*—
Tesch, William; and Lavallee, Michael H., 4,309,829, Cl. 34-10.000.

Lawrence, Randall K.: *See*—
Elmy, Raymond L.; Crabtree, Joe; Stevens, Aaron A.; and Lawrence, Randall K., 4,310,082, Cl. 192-11.000.

Lawser, John J., to Bell Telephone Laboratories, Incorporated. Method of processing special service telephone calls. 4,310,727, Cl. 179-18.00B.

Lay nee Konya, Aranka: *See*—
Budai, Zoltan; Jurak, Ferenc; Kis-tamas, Attila; Lay nee Konya, Aranka; Mezei, Tibor; Vig, Zoltan; and Zubovits nee Kristof, Terez, 4,310,348, Cl. 71-121.000.

Lazarus, Stanley D.; Cooke, Robert S.; and Galick, Paul E., to Allied Corporation. Production of polyester thermally stabilized with an oxirane. 4,310,658, Cl. 528-309.000.

Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique Cii Honeywell Bull (Societe Anonyme). Portable card incorporating magnetic bubble elements. 4,310,897, Cl. 365-1.000.

Lebedev, Vladimir K.: *See*—
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Miroshnichenko, Alexandr P., 4,310,737, Cl. 219-59.100.

Le Berre, Serge: *See*—
Hareng, Michel; Le Berre, Serge; and Leclerc, Pierre, 4,310,858, Cl. 358-302.000.

Lechevin, Jean-Claude: *See*—
Boschetti, Eugene; and Lechevin, Jean-Claude, 4,310,536, Cl. 424-281.000.

Leclerc, Pierre: *See*—
Hareng, Michel; Le Berre, Serge; and Leclerc, Pierre, 4,310,858, Cl. 358-302.000.

LeDuc, Kenneth: *See*—
West, Jon K.; LeDuc, Kenneth; and Ferrus, Serge, 4,310,421, Cl. 210-740.000.

Lee, Chi C.; and Ludwig, Richard E., to Du Pont de Nemours, E. I., and Company. Security paper from film-fibril sheets. 4,310,591, Cl. 428-283.000.

Lee, John D.: *See*—
Aujla, Sharanjit S.; and Lee, John D., 4,310,212, Cl. 339-97.00R.

Lee, John W.: *See*—
Schrougham, Benton; and Lee, John W., 4,309,797, Cl. 24-307.000.

Lee-Norse Company: *See*—
McCracken, William E.; and Hakes, Gary A., 4,310,197, Cl. 299-11.000.

Lee, Richard H.: *See*—
Rasmussen, David H.; and Lee, Richard H., 4,310,036, Cl. 141-114.000.

Lee, Tzuo-Chang; and Tamura, Poohsan N., to Honeywell Inc. High speed ambiguity function evaluation by optical processing. 4,310,894, Cl. 364-822.000.

Leesona Corporation: *See*—
Batson, Edward E., 4,309,929, Cl. 83-554.000.

Leet, Warren E., to General Motors Corporation. Transmission and control system. 4,309,917, Cl. 74-861.000.

Legutke, Gunter; Rechmeier, Gerhard H.; Scholz, Harald; Schuchardt, Kurt; Holler, Ernst; and Liesenfelder, Gunther, to Hoechst Aktiengesellschaft. Production of 1,2-dichloroethane. 4,310,713, Cl. 570-243.000.

Lehmann, Werner: *See*—
Wanner, Karl; Thome, Ludwig; Faelchle, Joerg; and Lehmann, Werner, 4,310,055, Cl. 173-118.000.

Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Kohl, Albert; Spoor, Herbert; Mahler, Karl; and Balz, Werner, to BASF Aktiengesellschaft. Process of making a magnetic recording media. 4,310,565, Cl. 427-48.000.

Leiner, Hans-Richard, to Robert Bosch GmbH. Method and apparatus for recording data on and reading data from magnetic storages. 4,310,860, Cl. 360-40.000.

Leiser, Roger S., to A. E. Staley Manufacturing Company. Fructose production. 4,310,628, Cl. 435-94.000.

Lelandais, Guy, to Enertec. Magnetic tape recorders. 4,310,863, Cl. 360-90.000.

Leonard, Gary S.; and Zinsmeyer, Thomas M., to Carrier Corporation. Method and apparatus for satisfying heating and cooling demands and control therefor. 4,309,876, Cl. 62-79.000.

Le Pecq, Jean-Bernard; and Paoletti, Claude, to Agence Nationale de Valorisation de la Recherche (ANVAR). 2-N Quaternary ammonium salt derivatives of 9-hydroxy ellipticine. 4,310,667, Cl. 546-70.000.

Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 5-(Pyridinyl)-benzoxazol-2(3H)-ones and their use as cardiotonics. 4,310,531, Cl. 424-263.000.

Leva, Max. Tower packing assembly. 4,310,475, Cl. 261-113.000.

Lever Brothers Company: *See*—
Brouwer, Hendrik W., 4,310,432, Cl. 252-108.000.

Levitt, George; and Sauers, Richard F., to Du Pont de Nemours, E. I., and Company. N(Substituted phenylsulfonyl) N'(substituted cyumidin-2-yl) ureas. 4,310,346, Cl. 71-92.000.

Levolor Lorentzen, Inc.: *See*—
Anderle, Joseph A., 4,309,858, Cl. 52-632.000.

Lewin, Ian: *See*—
Small, Edward A., Jr.; and Lewin, Ian, 4,310,876, Cl. 362-298.000.

Lewis, J. Stephen: *See*—
Gretz, Bonita M.; Lewis, J. Stephen; and Shireman, Cyril G., 4,309,879, Cl. 63-29.00R.

LGZ Landis & Gyr Zug AG: *See*—
Rey, Fredy, 4,310,829, Cl. 340-310.00A.

Liang, Charles C.; Bolster, M. Elizabeth; and Murphy, Robert M., to Wilson Greatbatch Ltd. Metal oxide composite cathode material for high energy density batteries. 4,310,609, Cl. 429-194.000.

Libbey-Owens-Ford Company: *See*—
Shaw, Anthony R.; Krueger, Wallace F.; and Bastian, Lloyd E., 4,310,116, Cl. 228-183.000.

Lichtenberger, W. Wayne; and Johnston, John R. Bit sampling multiplexer apparatus. 4,310,922, Cl. 370-48.000.

Lieber, Albert J.; and Sutphin, Howard D. Proximity focused streak tube and camera using the same. 4,310,857, Cl. 358-217.000.

Lieberman, Benjamin. Method for recovering lead from batteries. 4,310,351, Cl. 75-77.000.

Lieder, Bernhard: *See*—
Schmidt, Volkmar; Lieder, Bernhard; Scheve, Heinrich; and Dohren, Hans, 4,310,333, Cl. 48-77.000.

Liesenfelder, Gunther: *See*—
Legutke, Gunter; Rechmeier, Gerhard H.; Scholz, Harald; Schuchardt, Kurt; Holler, Ernst; and Liesenfelder, Gunther, 4,310,713, Cl. 570-243.000.

Liftab Corporation: *See*—
Miller, Raphael W., 4,309,921, Cl. 81-3.46R.

Lignes Telegraphiques et Telephoniques: *See*—
Hulin, Jean Pierre, 4,309,864, Cl. 57-6.000.

Lillestolen, Tom: *See*—
Bengtsson, Sune; and Lillestolen, Tom, 4,310,691, Cl. 562-584.000.

Lillie, James B.; and Sanford, James L., to International Business Machines Corporation. Fast cycling, low power driver for an electromagnetic device. 4,310,868, Cl. 361-154.000.

Lindblom, Kenneth J.: *See*—
Oliver, Robert J.; Lindblom, Kenneth J.; Idelman, Lloyd B.; and Medo, Carl S., 4,310,026, Cl. 137-637.000.

Linde Aktiengesellschaft: *See*—
Wernicke, Hans J.; Kreuter, Walter; and Schliebener, Claus, 4,310,409, Cl. 208-57.000.

Lindemans, Fredric W., to Medtronic, Inc. Implantable pulse generator having separate passive sensing reference electrode. 4,310,000, Cl. 128-419.0PG.

Lindner, Alfred: *See*—
Volkamer, Klaus; Broellos, Klaus; Lindner, Alfred; Wagner, Ulrich; Weitz, Hans-Martin; and Schneider, Klaus-Juergen, 4,310,388, Cl. 203-51.000.

Linecker, Josef. Cross-country ski binding. 4,310,170, Cl. 280-636.000.

Link, Erwin F.; and Schubert, William L., to International Harvester Company. Hydrostatic steering arrangement. 4,310,062, Cl. 180-139.000.

Lipha, Lyonnaise Industrielle Pharmaceutique: *See*—
Boschetti, Eugene; and Lechevin, Jean-Claude, 4,310,536, Cl. 424-281.000.

Liquid Crystal Products, Inc.: *See*—
Davison, Thomas W.; and Suzuki, Fred K., 4,310,577, Cl. 428-1.000.

Lison, George C.: *See*—
Stearns, William J.; and Lison, George C., 4,310,732, Cl. 179-156.00A.

Lissau, Frederic, to Sloan Valve Company. Automatic flushing system. 4,309,781, Cl. 4-304.000.

Litot, Jean P.: *See*—
Roche, Marcel; and Litot, Jean P., 4,310,362, Cl. 148-1.500.

Locatell, Louis, Jr.: *See*—
Foley, James W.; Locatell, Louis, Jr.; and Zepp, Charles M., 4,310,673, Cl. 548-207.000.

Lockheed Corporation: *See*—
Bradley, Robert E.; and Keithler, William R., 4,310,390, Cl. 204-37.00R.

Lok, Brent M.: *See*—
Wilson, Stephen T.; Lok, Brent M.; and Flanigen, Edith M., 4,310,440, Cl. 252-435.000.

Longley, Kermit D.; and Karalis, Anastasios J., to Witco Chemical Corporation. Sulfosuccinate diesters. 4,310,683, Cl. 560-151.000.

Longyear Company: *See*—
Beckley, Gary H.; Svendsen, Walter W.; and Anderson, Ronald B., 4,309,922, Cl. 81-57.160.

Lorenz, Reinhold, to Schlesinger GmbH & Co. Maschinenbau KG. Machine for the manufacture of brushes. 4,310,377, Cl. 156-499.000.

Lorenzo, Joseph A.; and Mannella, Henry E., to Xerox Corporation. Job programming. 4,310,235, Cl. 355-6.000.

Loshbough, Richard C., to Reliance Electric Company. Digital scale. 4,310,893, Cl. 364-567.000.

Lovering, Dennis W., to Kwikform Limited. Soffit supporting structure. 4,309,857, Cl. 52-632.000.

Lowe, Colin F. Frameless metal building. 4,309,853, Cl. 52-90.000.

Lowerre, William M., Jr. Infusion type beverage maker. 4,309,940, Cl. 99-281.000.

Lowery, Kirby, Jr.: *See*—
Shipley, Randall S.; and Lowery, Kirby, Jr., 4,310,648, Cl. 526-114.000.

Loy, Jeffrey A.; Goetsch, Albert H.; and Lahman, John W., to Sundstrand Corporation. Door securing mechanism. 4,310,187, Cl. 292-56.000.

Lucas Industries Limited: *See*—
Green, Alan C.; and Gregory, Stephen D., 4,310,291, Cl. 417-435.000.

Lucchini, Paolo: *See*—
Babini, Giancarlo; Fabbri, Bruno; and Lucchini, Paolo, 4,310,830, Cl. 340-347.0AD.

Luckey, George W., to Eastman Kodak Company. Contrast agent for radiography. 4,310,507, Cl. 424-4.000.

Ludlow Corporation: *See*—
Turner, Howard M., 4,310,035, Cl. 141-97.000.

Ludwig, George C., to Tom McGuane Industries, Inc. Fuel pressure regulator assembly. 4,310,142, Cl. 251-30.000.

Ludwig, Richard E.: *See*—
Lee, Chi C.; and Ludwig, Richard E., 4,310,591, Cl. 428-283.000.

Lueder, Holger. Equipment for the homogeneous radiant conditioning of a room enclosure for therapeutic purposes. 4,309,999, Cl. 128-371.000.

LuK Lamellen und Kupplungsbau GmbH: *See*—
Maucher, Edmund, 4,310,083, Cl. 192-18.00R.

Lux, O. Wade. Liquid separator. 4,310,414, Cl. 210-238.000.

Lydiate, Jack: *See*—
Serban, Alexander; Farquharson, Graeme; Lydiate, Jack; and Bird, Graham J., 4,310,347, Cl. 71-93.000.

Lynn, Michael F.: *See*—
Kreft, Keith A.; Rossetti, Alan E.; and Lynn, Michael F., 4,309,900, Cl. 73-117.200.

Lys, Jacques: *See*—
Demaire, Georges; Lys, Jacques; and Berger, Michel, 4,310,396, Cl. 204-151.000.

Macaluso, Mary H. Pneumatic wheel skate device. 4,310,168, Cl. 280-11.240.

MacDonald, Russell J., to Ionics Inc. Synthesis of water soluble crosslinkers and their use in the manufacture of anionic polymers. 4,310,631, Cl. 521-38.000.

Mackarvich, Charles J. Nestable tie down anchor and package thereof. 4,310,090, Cl. 206-443.000.

Mackenzie, to Eagle-Picher Industries, Inc. Furnace for porcelain enameling. 4,310,300, Cl. 432-18.000.

MacMillan, Kenneth T., to Donald MacMillan & Son, Inc. Tire retreading machine. 4,310,374, Cl. 156-394.0FM.

Macol, George N., Jr.: *See*—
Schopp, Anthony L.; and Macol, George N., Jr., 4,310,134, Cl. 248-210.000.

Macovski, Albert: *See*—
Frohbach, Hugh F.; Macovski, Albert; Peppers, Norman A.; Siwecki, Thomas L.; and Schaefer, Louis F., 4,310,847, Cl. 358-54.000.

Madden, Mark R.: *See*—
Jacobi, Edgar F., Jr.; and Madden, Mark R., 4,309,874, Cl. 60-648.000.

Madsen, Laust O.: *See*—
Balslev, Jorgen; and Madsen, Laust O., 4,310,478, Cl. 264-22.000.

Madson, Lawrence P., to Technicare Corporation. Data simulation in sector scan imaging systems. 4,310,853, Cl. 358-140.000.

Maeda, Akio; Hashimoto, Kinro; Inagami, Masaaki; and Fukushima, Hiroshi, to Nippon Zeon Co., Ltd. Vulcanizable rubber composition. 4,310,643, Cl. 525-468.000.

Maeda, Isamu; and Aoshima, Masashi, to Sumitomo Chemical Company, Limited. Process for vulcanizing halogen containing rubber composition at a low temperature. 4,310,443, Cl. 260-5.000.

Maeda, Shigemi: *See*—
Juso, Hiromi; Tsuji, Shigeki; and Maeda, Shigemi, 4,310,838, Cl. 340-701.000.

Magee, Edward L., Jr.: *See*—
Olson, Norman F.; and Magee, Edward L., Jr., 4,310,554, Cl. 426-40.000.

Magel, Rolf, to Ernst Leitz Wetzlar GmbH. Method and apparatus for automatic exposure control on a photographic camera. 4,310,229, Cl. 354-43.000.

Magnetic Peripherals Inc.: *See*—
Patel, Dilip C.; Stricklin, John D.; and Koehne, Bruno, 4,310,864, Cl. 360-97.000.

Mahler, Karl: *See*—
Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Kohl, Albert; Spoor, Herbert; Mahler, Karl; and Balz, Werner, 4,310,565, Cl. 427-48.000.

Maida, Osamu, to Nippon Kogaku K.K. Battery voltage checking device. 4,310,606, Cl. 429-93.000.

Maier, Lawrence C., to Simmonds Precision Products, Inc. Capacitive probe detection systems. 4,310,794, Cl. 324-61.00R.

Maiocco, Guiseppe, to Arman S.p.A. Antitheft device for motor vehicles. 4,309,882, Cl. 70-186.000.

Maizenberg, Mikhail I.; Kaplan, Mikhail D.; Veremeenko, Stanislav V.; Bobrov, Vladimir T.; Moshkovich, Vladimir U.; Shapovalov, Petr F.; Troitsky, Vladimiru A.; Zhukovsky, Petr G.; and Komsky, Igor B. Method for detecting non-uniformities of magnetic materials and device for effecting same. 4,309,905, Cl. 73-601.000.

Makino, Yoshihiro: *See*—
Yamada, Mitsuhiro; Katayama, Hirokazu; Ishii, Toshitsugu; Makino, Yoshihiro; and Kamio, Masashi, 4,310,487, Cl. 422-68.000.

Makowski, Henry S., deceased (by Makowski, Patricia H., executrix), to Exxon Research & Engineering Co. Process for forming a barium sulfonate containing polymer. 4,310,445, Cl. 260-23.50A.

Makowski, Henry S., deceased: *See*—
Agarwal, Pawan K.; and Makowski, Henry S., deceased, 4,310,457, Cl. 260-235.000.

Makowski, Patricia H., executrix: *See*—
Agarwal, Pawan K.; and Makowski, Henry S., deceased, 4,310,457, Cl. 260-235.000.
Makowski, Henry S., deceased, 4,310,445, Cl. 260-23.50A.

Malaccorto, Alexander E.: *See*—
Hunter, Paul W.; and Malaccorto, Alexander E., 4,310,882, Cl. 364-200.000.

Malafosse, Jean; and Rignon, Maurice, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for preparing peroxydisulfates of alkali metals and ammonium. 4,310,394, Cl. 204-82.000.

Malki, Khaldoun W.; and Angelini, Edward J., to Combustion Engineering, Inc. Temperature control for dry SO_2 scrubbing system. 4,310,498, Cl. 423-242.000.

Mallard, John R.: *See*—
Hutchison, James M. S.; Sutherland, Robert J.; Edelstein, William A.; and Mallard, John R., 4,310,799, Cl. 324-319.000.

Maliya, Prakash: *See*—
Barabas, Eugene S.; Maliya, Prakash; and Gromelski, Stanley J., Jr., 4,310,687, Cl. 560-221.000.

Malsbury, Richard G.; and McGahan, Wallace A., to Ingersoll-Rand Company. Friction rock stabilizer and method of inserting same in an earth structure bore. 4,310,266, Cl. 405-259.000.

Manber, Solomon; Chiang, David; and Chu, Mosi. Indicia recording apparatus. 4,310,226, Cl. 354-5.000.

Manfre, Giovanni; Mironi, Jonathan; and Moschini, Renzo, to Centro Ricerche Fiat S.p.A. Process for the preparation of a mixture comprising a solid phase and a liquid phase of a metal alloy, and device for its performance. 4,310,352, Cl. 75-93.00R.

Mangold, Dietrich: *See*—
Reissenweber, Gernot; and Mangold, Dietrich, 4,310,677, Cl. 560-22.000.

Mank, Klaus-Dieter; and Prommel, Gunther, to Jungheinrich Unternehmensverwaltung KG. Vehicle which is steerable along a guide wire lying in the ground. 4,310,789, Cl. 318-587.000.

Manley, Harold J.; and de Lellis, Joseph, Jr., to United States of America, Army. Half duplex integral vocoder modem system. 4,310,721, Cl. 179-1.0SA.

Mannella, Henry E.: *See*—
Lorenzo, Joseph A.; and Mannella, Henry E., 4,310,235, Cl. 355-6.000.

Mannesmann Aktiengesellschaft: *See*—
Hiersig, Heinz M.; and Wedler, Herbert, 4,309,914, Cl. 74-15.400.

Mannesmann DeMag AG: *See*—
Appel, Manfred; Moslener, Jorn; and Spiecker, Karl-Heinz, 4,310,031, Cl. 140-2.000.
Wenzel, Jurgen M.; and Birkheuer, Horst V., 4,310,278, Cl. 414-332.000.

Manser, Karl, to Migros Genossenschafts-Bund. Folding box and blank for fabricating the same. 4,310,093, Cl. 206-624.000.

Marathon Oil Company: *See*—
Tackett, James E., Jr., 4,310,011, Cl. 137-13.000.

Marchetti, Peter G., to Energy Research Corporation. Fuel cell system and temperature control therefore. 4,310,604, Cl. 429-17.000.

Maremont Corporation: *See*—
Whiteside, John F., 4,310,077, Cl. 188-282.000.

Margolin, George D.: *See*—
Azcua, Noris S.; Margolin, George D.; Miller, Audrey; and Vurpillat, Victor V., 4,310,885, Cl. 364-405.000.

Margotte, Dieter; Nouvertne, Werner; Neuray, Dieter; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Graft polycarbonates, their preparation and their use as moldings. 4,310,642, Cl. 525-468.000.

Marhold, Albrecht: *See*—
Lantzsch, Reinhard; Marhold, Albrecht; Behrenz, Wolfgang; and Hammann, Ingeborg, 4,310,540, Cl. 424-282.000.

Marion, Thomas E., to Maryland Cup Corporation. Flexographic printing unit. 4,309,945, Cl. 101-247.000.

Mark, Harry B., Jr.; Czerwinski, Andrzej; and Caja, Josip. Thin layer electrode and cell. 4,310,400, Cl. 204-195.00M.

Markert, Helmut: *See*—
Bauer, Kurt; Hesch, Georg; Huber, Hans; Markert, Helmut; and Roth, Christian, 4,309,790, Cl. 15-250.420.

Marlboro Marketing, Inc.: *See*—
Merl, Milton J., 4,310,097, Cl. 211-49.00D.

Marley-Wylain Company, The: *See*—
Deters, Elmer M., 4,310,033, Cl. 141-44.000.

Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. Novel cyclopropane carboxylic acid esters. 4,310,542, Cl. 424-304.000.

Martens, Theophile, to Siderurgie Maritime (Maritieme Staalnijverheid) SIDMAR S.A. Method of and apparatus for the dry quenching of coke. 4,310,386, Cl. 201-39.000.

Martin, Gregory K.; and Brunner, Alexander, to Visual Systems Corp. Microfilm indexing machine. 4,310,751, Cl. 235-92.0MP.

Martin, Hans; and Scharpf, Kurt, to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG. Elastomeric packing for a clamped connection. 4,310,165, Cl. 277-205.000.

Martin, Roger C. Shellfish meat and shell separation process and apparatus. 4,309,793, Cl. 17-46.000.

Martin, Walter L., Jr., to PPG Industries, Inc. Air fin coolers. 4,310,602, Cl. 428-596.000.

Maruyama, Hiromi: *See*—
Ichimiya, Yoshichika; Sudo, Tsuneta; Maruyama, Hiromi; Sugamori, Shigeru; Sumida, Susumu; and Tokuno, Takashi, 4,310,802, Cl. 328-110.000.

Marvin Glass & Associates: *See*—
Kulesza, Ralph J.; and Disko, Harry, 4,309,840, Cl. 46-68.000.
Kulesza, Ralph J.; Wildman, John R.; and Meyer, Burton C., 4,310,156, Cl. 273-1.0GE.

Marx, Matthias: *See*—
Horacek, Heinrich; Barl, Manfred; Wurmb, Rolf; and Marx, Matthias, 4,310,632, Cl. 521-121.000.

Maryland Cup Corporation: *See*—
Marion, Thomas E., 4,309,945, Cl. 101-247.000.

Masilamani, Divakaran; and Rogic, Milorad M., to Allied Corporation. Selective monochlorination of ketones and aromatic alcohols. 4,310,702, Cl. 568-348.000.

Massachusetts General Hospital: *See*—
Holick, Michael F., 4,310,511, Cl. 424-59.000.

Mastrogiannis, Spiridon A. Lifting and descent mechanism-criket. 4,310,070, Cl. 182-134.000.
Matsubara, Kentaro: *See—*
Matsuo, Yoshio; and Matsubara, Kentaro, 4,310,120, Cl. 238-349.000.
Matsumoto, Seiji: *See—*
Kato, Hisatoyo; Ishida, Masamitsu; and Matsumoto, Seiji, 4,310,886, Cl. 364-414.000.
Matsumura, Shoichi: *See—*
Kato, Yasushi; Furukawa, Hisao; Matsumura, Shoichi; and Nakatsuka, Saori, 4,310,640, Cl. 525-100.000.
Matsuo, Akira: *See—*
Oka, Hitoshi; Nakamura, Kenji; Yokono, Hitoshi; Isogai, Tokio; Matsuo, Akira; Miyazawa, Osamu; and Tanaka, Isamu, 4,310,563, Cl. 427-8.000.
Matsuo, Yoshio; and Matsubara, Kentaro, to Tetsudo Kizai Kogyo Company Limited. Elastic rail fastening device. 4,310,120, Cl. 238-349.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Ichiyanagi, Takashi; Imanishi, Kiyokazu; Kawa, Hidetoshi; and Yamamoto, Katsuyuki, 4,310,130, Cl. 242-179.000.
Tachita, Ryobun; Hayakawa, Yoshihiro; Fukukita, Hiroshi; Yano, Tsutomu; Irioka, Kazuyoshi; and Fukumoto, Akira, 4,310,907, Cl. 367-11.000.
Matsushita Electric Works, Ltd.: *See—*
Azuma, Tomisaburo; Murakami, Takeru; and Date, Haruyuki, 4,310,358, Cl. 106-97.000.
Takeyama, Hidetoshi; Uezasa, Yukihiro; and Yuasa, Yasuo, 4,309,816, Cl. 29-622.000.
Matsushita, Masahisa: *See—*
Kisida, Ichihei; Kobayashi, Takashi; and Matsushita, Masahisa, 4,310,118, Cl. 229-62.500.
Matsuura, Ichiro; and Yamaguchi, Fumio, to Nippon Electric Glass Company, Limited. Low temperature sealing glass. 4,310,357, Cl. 501-15.000.
Matsuura, Masataka: *See—*
Takamatsu, Toshiaki; Minezaki, Shigehiro; Matsuura, Masataka; and Uede, Hisashi, 4,309,814, Cl. 29-592.00R.
Mattel, Inc.: *See—*
Gretz, Bonita M.; Lewis, J. Stephen; and Shireman, Cyril G., 4,309,879, Cl. 63-29.00R.
Matthes, William R., to General Motors Corporation. Induction system with high-swirl intake valve. 4,309,969, Cl. 123-188.0VA.
Maucher, Edmund, to LuK Lamellen und Kupplungsbau GmbH. Device for connecting a driving element to a driven element so as to be locked against mutual rotation, and for separating the same. 4,310,083, Cl. 192-18.00R.
Mauk, Marcia R.: *See—*
Baldeschwieler, John D.; Gamble, Ronald C.; Mauk, Marcia R.; Shen, Tsung-Ying; and Ponpipom, Mitree M., 4,310,505, Cl. 424-1.000.
Baldeschwieler, John D.; Gamble, Ronald C.; and Mauk, Marcia R., 4,310,506, Cl. 424-1.000.
Max Factor & Company: *See—*
Sekine, Shigeo, 4,310,101, Cl. 215-330.000.
Maydan, Dan: *See—*
Flamm, Daniel L.; Maydan, Dan; and Wang, David N., 4,310,380, Cl. 156-643.000.
Mayers, Richard R.; and Chojnacki, Dennis A., to Midland-Ross Corporation. Combination burner and exhaust gas recirculation system for a carbottom furnace. 4,310,301, Cl. 432-121.000.
Mazzone, Frank L.; and Tegda, Joseph E., to Bechtel International Corporation. Ship lock system with hydroelectric pumped-storage capability. 4,310,769, Cl. 290-54.000.
McCall, Richard H., to Texaco Inc. Method for testing the minimum pullout strength of a ground anchor (D73,790-C1-D2). 4,309,911, Cl. 73-862.530.
McCann, Dennis: *See—*
Moretti, Michael; and McCann, Dennis, 4,310,738, Cl. 219-10.55A.
McCann, Farrell A.: *See—*
Neu, Horst W.; Gilmore, Thomas; and McCann, Farrell A., 4,310,269, Cl. 408-11.000.
McClaskey, Billy M. Siphon device. 4,310,013, Cl. 137-145.000.
McCormack, Richard A.; and Jensen, Eric A., to Thermal Energy Storage, Inc. Closed vaporization heat transfer system. 4,309,980, Cl. 126-263.000.
McCracken, William E.; and Hakes, Gary A., to Lee-Norse Company. Mining and bolting method and apparatus. 4,310,197, Cl. 299-11.000.
McDonnell Douglas Corporation: *See—*
Rose, Alan L.; and Richman, David W., 4,310,408, Cl. 204-301.000.
McElligott, Michael J.: *See—*
Mowry, William H., Jr.; McElligott, Michael J.; Tkalenko, Victor J., Jr.; and Baran, Joseph, 4,310,180, Cl. 283-8.00B.
McEntire, Edward E.; and Zimmerman, Robert L., to Texaco Development Corp. Novel polyisocyanurate catalyst. 4,310,634, Cl. 521-115.000.
McGahan, Wallace A.: *See—*
Malsbury, Richard G.; and McGahan, Wallace A., 4,310,266, Cl. 405-259.000.
McGee, David J.: *See—*
Braithwaite, John C.; and McGee, David J., 4,310,796, Cl. 324-220.000.
McGrath, N. Christian, to Sprague Electric Company. Batch method for terminating solid electrolyte capacitors. 4,310,566, Cl. 427-80.000.
McKay, Dwight L., to Phillips Petroleum Company. Cracking process. 4,310,410, Cl. 208-120.000.
McKee, Donald E., to Rockwell International Corporation. Digital position sensor including L/C sensing oscillator. 4,310,807, Cl. 331-65.000.
McLain, Donald E., to Kalamazoo Incorporated Technology. Nut and retainer for quick adjustable jaw wrench. 4,309,924, Cl. 81-159.000.
McLaurin, Colin A., to University of Virginia Alumni Patents Foundation, The. Center of gravity wheelchair with articulated chassis. 4,310,167, Cl. 280-5.280.
McMurry/Hughes, Inc.: *See—*
Torres, Carlos A., 4,309,899, Cl. 73-86.000.
McNiel, Fred A. Automatic circuit breaking accessory for an electric storage battery. 4,310,817, Cl. 335-13.000.
Mearl Corporation, The: *See—*
Cooper, Scott A.; Shetty, Ramakrishna; and Pinsky, Jules, 4,310,584, Cl. 428-212.000.
Measurex Corporation: *See—*
Rastogi, Laxmi K., 4,309,949, Cl. 110-341.000.
Medical Devices, Inc.: *See—*
Schwoboda, George F.; and Wingrove, Robert C., 4,309,913, Cl. 74-3.520.
Medicoteknisk Institut, Svejsecentralen: *See—*
Northeved, Allan; and Fabrin, Knud C. C., 4,309,906, Cl. 73-612.000.
Medinger, Bernhard: *See—*
Dorfel, Werner H.; Medinger, Bernhard; and Troxler, Eduard, 4,310,483, Cl. 264-117.000.
Medo, Carl S.: *See—*
Oliver, Robert J.; Lindblom, Kenneth J.; Idelman, Lloyd B.; and Medo, Carl S., 4,310,026, Cl. 137-637.000.
Medtronic, Inc.: *See—*
Comben, Richard H., 4,310,001, Cl. 128-419.00P.
Lindemans, Fredric W., 4,310,000, Cl. 128-419.0PG.
Mehaffey, Joseph H., to Solid State Systems, Inc. Interface for private branch exchange. 4,310,725, Cl. 179-18.0AH.
Meistergram Inc.: *See—*
Franklin, Paul F., 4,309,950, Cl. 112-103.000.
Melliger, Guido W. Coating process and apparatus. 4,310,562, Cl. 427-3.000.
Melvin, Lawrence S., Jr.: *See—*
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,310,529, Cl. 424-263.000.
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,310,668, Cl. 546-204.000.
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,310,669, Cl. 546-206.000.
Mendoza, Abel, to Dow Chemical Company, The. Reduction of hydrolyzable chloride impurities in an isocyanatoalkyl ester of an organic carboxylic acid. 4,310,688, Cl. 560-222.000.
Mengler, Claus-Dieter: *See—*
Vangermain, Erwin; Mengler, Claus-Dieter; Elm, Rainer; Ueberschaer, Horst; and Brauckmann, Wilhelm, 4,310,442, Cl. 252-455.00R.
Merck & Co., Inc.: *See—*
Albers-Schonberg, George; Wallick, Hyman; Ormond, Robert E.; Miller, Thomas W.; and Burg, Richard W., 4,310,519, Cl. 424-181.000.
Christensen, Burton G.; and Ratcliffe, Ronald W., 4,310,538, Cl. 424-274.000.
Durette, Philippe L., 4,310,514, Cl. 424-88.000.
Freidinger, Roger M.; and Veber, Daniel F., 4,310,518, Cl. 424-177.000.
Wang, Ching C.; and Dick, Nancy J., 4,310,541, Cl. 424-304.000.
Meredith, Michael D.; Edwards, Louis L., Jr.; and Van Scotter, Keith T., to Weyerhaeuser Company. Reducing chemical transfer between treatment stages. 4,310,384, Cl. 162-60.000.
Meredith, Nolan J. Color control system. 4,310,248, Cl. 356-402.000.
Merkle, Ralph H., to General Motors Corporation. Vehicle axle attachment. 4,310,171, Cl. 280-688.000.
Merl, Milton J., to Marlboro Marketing, Inc. Gravity feed combined display and storage unit. 4,310,097, Cl. 211-49.00D.
Merz, Johann, to Zahnradfabrik Friedrichshafen, AG. Hydraulically operated steering system with pressure control. 4,310,289, Cl. 417-87.000.
Mesnel, Francois, to Establissements Mesnel. Composite reinforced sealing strip. 4,310,164, Cl. 277-189.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See—*
Brunsch, Klaus; Schindler, Rudolf; Bongers, Bernd; and Schulz, Ralf-Thilo, 4,309,865, Cl. 57-15.000.
Metallgesellschaft AG: *See—*
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Metallgesellschaft A.G.: *See—*
Reh, Lothar; Schmidt, Hans W.; Sauer, Harald; Winkhaus, Gunter; Thome, Roland; and Moritz, Dieter, 4,310,501, Cl. 423-484.000.
Metzger, Donald L.: *See—*
Fetterolf, James R., Sr.; Metzger, Donald L.; Snyder, Clair W., Jr.; and Wise, James H., 4,310,213, Cl. 339-103.00M.
Meyer, Burton C.: *See—*
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Meyer, Rudolf, to AGFA-Gevaert Aktiengesellschaft. Method of processing a photographic material using a processing liquid. 4,310,620, Cl. 430-404.000.

Mezei, Tibor: *See—*
Budai, Zoltan; Jurak, Ferenc; Kis-tamas, Attila; Lay nee Konya, Aranka; Mezei, Tibor; Vig, Zoltan; and Zubovits nee Kristof, Terez, 4,310,348, Cl. 71-121.000.
Michaelis, Klaus-Peter; and Muller, Horst, to Ciba-Geigy Corporation. Novel organo-tin compounds. 4,310,454, Cl. 260-45.75S.
Michalak, Stanislaw, to L. & C. Steinmuller GmbH. Regenerative heat exchanger. 4,310,046, Cl. 165-5.000.
Michiki, Hideyuki: *See—*
Sada, Eizo; Katoh, Shigeo; Toei, Ryozo; and Michiki, Hideyuki, 4,310,253, Cl. 366-273.000.
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Fuerneisen, Thomas J., 4,310,908, Cl. 368-88.000.
Midland-Ross Corporation: *See—*
Hanula, Richard M., 4,310,099, Cl. 213-62.00A.
Mayers, Richard R.; and Chojnacki, Dennis A., 4,310,301, Cl. 432-121.000.
Thekdi, Arvind C.; Buchwald, Robert W.; and Schmall, Robert A., 4,310,302, Cl. 432-205.000.
Mifune, Hiroyuki: *See—*
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Migros Genossenschafts-Bund: *See—*
Manser, Karl, 4,310,093, Cl. 206-624.000.
Mikasa Chemical Industry Company, Limited: *See—*
Narazaki, Mitsutoshi, 4,310,520, Cl. 424-200.000.
Mikulecki, Karl: *See—*
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Miles Laboratories, Inc.: *See—*
Burkhardt, Alan E.; and Tideman, Ann M., 4,310,626, Cl. 435-28.000.
Kramer, Donald L., 4,310,249, Cl. 356-414.000.
Miley, John W., to Milliken Research Corporation. Vinyl ester resin compositions. 4,310,644, Cl. 525-507.000.
Miller, Albert A.; and Wilson, Andrew G., to AB Volvo. Retarding means for motor vehicles. 4,309,918, Cl. 74-867.000.
Miller, Audrey: *See—*
Azcua, Noris S.; Margolin, George D.; Miller, Audrey; and Vurpillat, Victor V., 4,310,885, Cl. 364-405.000.
Miller, Franklyn D.: *See—*
Muller, Werner C.; and Miller, Franklyn D., 4,310,629, Cl. 435-162.000.
Miller, Michael E., to RCA Corporation. Stylus tracking aid using two bimorph elements longitudinally aligned. 4,310,913, Cl. 369-43.000.
Miller, Raphael W., to Liftab Corporation. Can top opener. 4,309,921, Cl. 81-3.46R.
Miller, Roland E.; Scaletta, Joseph A.; and Valek, John, to Kraftco Corporation. Apparatus for forming a container pan. 4,309,888, Cl. 72-334.000.
Miller, Roland G., to Pitney Bowes Inc. Electronic postage meter radiant energy device circuit. 4,310,755, Cl. 250-214.00R.
Miller, Thomas W.: *See—*
Albers-Schonberg, George; Wallick, Hyman; Ormond, Robert E.; Miller, Thomas W.; and Burg, Richard W., 4,310,519, Cl. 424-181.000.
Miller, William P.; and Twigg, Robert W., to Dixico Incorporated. Apparatus and method for fabricating a flexible cylinder from multiply flexible web material having metal and plastic plies. 4,310,369, Cl. 156-218.000.
Milliken Research Corporation: *See—*
Kimble, Victor W., 4,309,881, Cl. 68-205.00R.
Miley, John W., 4,310,644, Cl. 525-507.000.
Mills, Robert J., III: *See—*
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Mimoun, Hubert; Charpentier, Robert; and Roussel, Michel, to Institut Francais du Petrole. Process for manufacturing methyl ketones by oxidation of terminal olefins. 4,310,704, Cl. 568-385.000.
Minezaki, Shigehiro: *See—*
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Minning, Manfred: *See—*
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Minolta Camera Kabushiki Kaisha: *See—*
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Mironi, Jonathan: *See—*
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Miroshnichenko, Alexandr P.: *See—*
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Miroshnichenko, Alexandr P., 4,310,737, Cl. 219-59.100.
Miskinis, Edward T., to Eastman Kodak Company. Electrographic magnetic carrier particles. 4,310,611, Cl. 430-107.000.
Mita, Kou; Rokuta, Satoru; Takada, Kiyoshi; and Suzuki, Fuziko, to Snow Brand Milk Products Co., Ltd. Frozen confections having stabilized ice granules therein and process for making same. 4,310,559, Cl. 426-101.000.
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Yamagishi, Ryozo; Mita, Mamoru; Yoshioka, Osamu; and Ishikawa, Tetsuo, 4,309,959, Cl. 118-664.000.
Mitchell, Andrew: *See—*
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Mitomo, Mamoru; Kuramoto, Nobuyuki; and Inomata, Yoshizo, to National Institute for Researches in Inorganic Materials. Process for producing SIALON sintered product. 4,310,499, Cl. 423-327.000.
Mitrzyk, Jan C., Sr.; Gossoo, Rodney W.; Fischer, Charles P.; Silvernail, Howard N.; and Null, Charles, to Bendix Corporation, The. Apparatus for simultaneously cutting wire segments from a plurality of wires. 4,309,928, Cl. 83-161.000.
Mitsubishi Chemical Industries Limited: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; Fukami, Harukazu; Egawa, Mitsuo; and Ninomiya, Kunihiro, 4,310,534, Cl. 424-267.000.
Narazaki, Mitsutoshi, 4,310,520, Cl. 424-200.000.
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Mitsubishi Denki K.K.: *See—*
Takeuchi, Koichi; Okada, Takeo; and Aoki, Shinichi, 4,310,736, Cl. 200-144.00B.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Akamatsu, Masahiko, 4,310,791, Cl. 318-800.000.
Iwatani, Shiroh; and Morishita, Mitsuharu, 4,310,792, Cl. 322-28.000.
Takahashi, Masaru; and Sato, Kiyoshi, 4,310,210, Cl. 339-64.00M.
Yamada, Mitsuhiro; Katayama, Hirokazu; Ishii, Toshitsugu; Makino, Yoshihiro; and Kamio, Masashi, 4,310,487, Cl. 422-68.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
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Mitsubishi Kasei Kogyo Kabushiki Kaisha: *See—*
Ebina, Ryuzo; Nakayama, Tsutomu; and Tanaka, Minoru, 4,310,376, Cl. 156-499.000.
Mitsubishi Paper Mills, Ltd.: *See—*
Iguchi, Shigeru; and Emoto, Kazuhiro, 4,310,613, Cl. 430-251.000.
Mitzel, Wilhelm, to GAO Gesellschaft fur Automation und Organisation mbH. Stacker for flat material. 4,310,152, Cl. 271-186.000.
Miyakawa, Seiichi: *See—*
Mochizuki, Manabu; Miyakawa, Seiichi; Kimura, Taro; and Hashimoto, Junichiro, 4,310,238, Cl. 355-14.00D.
Miyasaka, Tomoaki; and Amano, Toshio, to Sony Corporation. Channel programming apparatus for a signal receiver. 4,310,924, Cl. 455-181.000.
Miyazawa, Osamu: *See—*
Oka, Hitoshi; Nakamura, Kenji; Yokono, Hitoshi; Isogai, Tokio; Matsuo, Akira; Miyazawa, Osamu; and Tanaka, Isamu, 4,310,563, Cl. 427-8.000.
Mizell, Ben: *See—*
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Mizukoshi, Yukio: *See—*
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Mobil Oil Corporation: *See—*
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Mochida, Haruo, to Nissan Motor Company, Limited. Automatic adjusting device for a clutch operating mechanism. 4,310,086, Cl. 192-111.00A.
Mochizuki, Manabu; Miyakawa, Seiichi; Kimura, Taro; and Hashimoto, Junichiro, to Ricoh Company, Ltd. Electrostatic copying apparatus. 4,310,238, Cl. 355-14.00D.
Mock, Thomas H.: *See—*
Canellis, Peter; and Mock, Thomas H., 4,310,271, Cl. 410-13.000.
Modrovich, Ivan E. Stabilized liquid coenzyme compositions for diagnostic determinations. 4,310,624, Cl. 435-4.000.
Modrovich, Ivan E. Stabilized liquid enzyme compositions for diagnostic determinations. 4,310,625, Cl. 435-15.000.
Moen, Lenard E. Method of manufacture of H-divider containers. 4,310,323, Cl. 493-92.000.
Mollet, Herbert; Oetiker, Alfred; and Boragine, Carlo, to Ciba-Geigy AG. Process for the production of masked positive color images by the silver dye bleach process. 4,310,617, Cl. 430-359.000.
Momiyama, Kikuo; and Yamaguchi, Shin, to Canon Kabushiki Kaisha. Variable soft-focus lens. 4,310,221, Cl. 350-431.000.
Monnig, Robert A.: *See—*
Huff, Arlen L., 4,310,195, Cl. 296-173.000.
Monsanto Company: *See—*
Coran, Aubert Y.; and Patel, Raman, 4,310,638, Cl. 525-183.000.
Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Process for liming pelts of animal hides and skins. 4,310,328, Cl. 8-94.160.
Mooberry, Jared B.; and Archie, William C., Jr., to Eastman Kodak Company. Blocked photographically useful compounds in photographic compositions, elements and processes employing them. 4,310,612, Cl. 430-223.000.
Mookherjee, Braja D.: *See—*
Wilson, Richard A.; Mookherjee, Braja D.; Hall, John B.; and Stork, Gilbert, 4,310,701, Cl. 568-347.000.
Mooney, Paul C., to Quick-Set, Incorporated. Backlash-free swivel and tilt mounting. 4,310,136, Cl. 248-278.000.
Moore Business Forms, Inc.: *See—*
Gullett, John R., 4,310,117, Cl. 229-73.000.
Moore, Norman B., to Christensen, Inc. Composite heavy metal drill collar. 4,310,059, Cl. 175-320.000.
Moretti, Michael; and McCann, Dennis. Microwave fluid heating system. 4,310,738, Cl. 219-10.55A.

Moretto, Hans-Heinrich: *See*—
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Mori, Fumio: *See*—
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Morigaki, Masakazu: *See*—
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Morinaga, Masaru, to NSK-Warner K.K. Seat belt retractor with emergency locking mechanism. 4,310,129, Cl. 242-107.40B.
Morishita, Mitsuharu: *See*—
Iwatani, Shiroh; and Morishita, Mitsuharu, 4,310,792, Cl. 322-28.000.
Morita, Masayuki; Kawaharazaki, Takashi; and Shimogawa, Toshiaki, to Nippon Soken, Inc. Seat belt retracting and winding device. 4,310,128, Cl. 242-107.000.
Morita, Toru; Takahasi, Yasumasa; Akamathu, Kohei; and Inothume, Takasi, to Sanyo Electric Co., Ltd. Magnetic beam adjusting arrangement. 4,310,819, Cl. 335-212.000.
Moritz, Dieter: *See*—
Reh, Lothar; Schmidt, Hans W.; Sauer, Harald; Winkhaus, Gunter; Thome, Roland; and Moritz, Dieter, 4,310,501, Cl. 423-484.000.
Morrison, Ian D.: *See*—
Steelhammer, Joe C.; Morrison, Ian D.; and Wittenbrook, Lawrence S., 4,310,438, Cl. 252-401.000.
Moschini, Renzo: *See*—
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Moseley, Kemper N. Lumber stacker and method. 4,310,274, Cl. 414-42.000.
Moser, Manfred: *See*—
Kutz, Johannes; and Moser, Manfred, 4,310,113, Cl. 226-4.000.
Moser, Robert E.: *See*—
Gullo, James M.; Heilman, William P.; Wayner, Robert J.; and Moser, Robert E., 4,310,551, Cl. 424-249.000.
Moshkovich, Vladimir U.: *See*—
Maizenberg, Mikhail I.; Kaplan, Mikhail D.; Veremeenko, Stanislav V.; Bobrov, Vladimir T.; Moshkovich, Vladimir U.; Shapovalov, Petr F.; Troitsky, Vladimiru A.; Zhukovsky, Petr G.; and Komsky, Igor B., 4,309,905, Cl. 73-601.000.
Moslener, Jorn: *See*—
Appel, Manfred; Moslener, Jorn; and Spiecker, Karl-Heinz, 4,310,031, Cl. 140-2.000.
Motoori, Ryuzo, to Nippon Kogaku K.K. Apparatus for preventing malfunction of an electric shutter device. 4,310,230, Cl. 354-50.000.
Motorola, Inc.: *See*—
Kia, Mansor; and Hanley, Harold G., 4,310,870, Cl. 361-415.000.
Ryon, Donald C., 4,310,804, Cl. 331-1.00A.
Motoyama, Shimesu; Yamada, Shuri; Kurita, Kaoru; and Iwasaki, Akira, to Freund Industrial Co., Ltd. Aerosol sprayer with pressure reservoir. 4,310,108, Cl. 222-396.000.
Mott, James D., to Hydril Co. Well safety system method and apparatus. 4,310,048, Cl. 166-212.000.
Mott, James D., to Hydril Co. Well safety valve apparatus. 4,310,051, Cl. 166-323.000.
Mottershead, Frank R.; Konkal, John J.; and Gerlach, Charles G., to Cross Company, The. Tool compensation mechanism. 4,309,925, Cl. 82-12.000.
Mowry, William H., Jr.; McElligott, Michael J.; Tkalenko, Victor J., Jr.; and Baran, Joseph, to Burroughs Corporation. Protected document and method of making same. 4,310,180, Cl. 283-8.00B.
Mozeleski, Edmund J.: *See*—
Oswald, Alexis A.; and Mozeleski, Edmund J., 4,310,471, Cl. 260-456.00P.
Mueller, Erwin R., to Rexnord Inc. Plug-shaped press crown for a press assembly. 4,309,893, Cl. 72-455.000.
Mueller, Martin S.: *See*—
Carter, William D.; and Mueller, Martin S., 4,310,848, Cl. 358-76.000.
Mulet-Marquis, Yves, to Kollmorgen Technologies Corporation. Device for position control. 4,310,790, Cl. 318-608.000.
Muller, Christoph. Photography shoulder bag with a pivotal lid. 4,310,092, Cl. 206-578.000.
Muller, Helmut; and Baessler, Konrad, to Hoechst Aktiengesellschaft. Process for preparing 5-chloro-2-nitrophenol. 4,310,711, Cl. 568-709.000.
Muller, Horst: *See*—
Michaelis, Klaus-Peter; and Muller, Horst, 4,310,454, Cl. 260-45.75S.
Muller, Reinhard: *See*—
Odenwalder, Heinrich; Frank, Karl; and Muller, Reinhard, 4,310,621, Cl. 430-443.000.
Muller, Werner C.; and Miller, Franklyn D., to National Distillers & Chemical Corp. Continuous fermentation process for producing ethanol. 4,310,629, Cl. 435-162.000.
Mullins, Keith M.: *See*—
Cammack, Michael A.; and Mullins, Keith M., 4,309,783, Cl. 5-508.000.
Multiflex, Inc.: *See*—
Boyce, Jennings A., 4,309,869, Cl. 57-293.000.
Murai, Shigeo: *See*—
Nishiyama, Ryuzo; Haga, Takahiro; Toki, Tadaaki; Koyanagi, Tohru; and Murai, Shigeo, 4,310,530, Cl. 424-263.000.
Murakami, Syozo; Yamanaka, Hiroaki; Yokoyama, Kazuhiro; Yone, Yasuhiro; and Yamaguchi, Tokuzi, to Nippon Steel Corporation. Method for classification of coals for coke production. 4,310,412, Cl. 209-10.000.
Murakami, Takeru: *See*—
Azuma, Tomisaburo; Murakami, Takeru; and Date, Haruyuki, 4,310,358, Cl. 106-97.000.
Murphy, Edward J.: *See*—
Krajewski, John J.; and Murphy, Edward J., 4,310,653, Cl. 528-143.000.
Murphy, Robert M.: *See*—
Liang, Charles C.; Bolster, M. Elizabeth; and Murphy, Robert M., 4,310,609, Cl. 429-194.000.
Murray Ohio Manufacturing Co., The: *See*—
Elmy, Raymond L.; Crabtree, Joe; Stevens, Aaron A.; and Lawrence, Randall K., 4,310,082, Cl. 192-11.000.
Mutchler, Paul A.: *See*—
Hensiek, Charles R.; Mutchler, Paul A.; and Timms, Rayford W., 4,309,978, Cl. 126-110.00B.
N-S-W Corporation: *See*—
Wilmeth, Claude H., 4,309,923, Cl. 81-57.340.
Naeve, Don A. Foldable frame structure. 4,309,835, Cl. 40-310.000.
Nagy, Laszlo: *See*—
Hajos, Andor; Fekete, Marton; Kurti, Marianna; Lang, Tibor; Toldy, Lajos; Borvendeg, Janos; Nagy, Laszlo; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,310,549, Cl. 424-330.000.
Nahm, Lee J., Jr., to Ralston Purina Company. Extruded fiber mixture pet food. 4,310,558, Cl. 426-98.000.
Nahra, John E.; and Woods, Walter, to Dasi Industries, Inc. Apparatus for treating fluent materials. 4,310,476, Cl. 261-118.000.
Nakagawa, Mineo: *See*—
Hojo, Shiro; Hasegawa, Yoichi; and Nakagawa, Mineo, 4,310,696, Cl. 564-464.000.
Nakamura, Kenji: *See*—
Oka, Hitoshi; Nakamura, Kenji; Yokono, Hitoshi; Isogai, Tokio; Matsuo, Akira; Miyazawa, Osamu; and Tanaka, Isamu, 4,310,563, Cl. 427-8.000.
Nakamura, Kiyoshi: *See*—
Nakanishi, Masae; Nakamura, Kiyoshi; and Kawasaki, Syozo, 4,310,492, Cl. 422-246.000.
Nakanishi, Masae; Nakamura, Kiyoshi; and Kawasaki, Syozo, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for making a single crystal. 4,310,492, Cl. 422-246.000.
Nakatsuka, Saori: *See*—
Kato, Yasushi; Furukawa, Hisao; Matsumura, Shoichi; and Nakatsuka, Saori, 4,310,640, Cl. 525-100.000.
Nakauchi, Hiroshi: *See*—
Kuwagaki, Hiroshi; Kato, Hiroaki; Takechi, Sadatoshi; Nakauchi, Hiroshi; and Inami, Yasuhiko, 4,310,220, Cl. 350-357.000.
Nakayama, Tsutomu: *See*—
Ebina, Ryuzo; Nakayama, Tsutomu; and Tanaka, Minoru, 4,310,376, Cl. 156-499.000.
Nakazima, Norio, to Kabushikikaisha Nakazima. Process for producing large-sized rectangular or square steel pipes. 4,310,740, Cl. 219-61.110.
Nalco Chemical Company: *See*—
Wun, Ten T., 4,310,427, Cl. 252-21.000.
Nann, Eberhard; and Heubner, Ulrich, to Metallgesellschaft AG. Low-antimony lead alloy. 4,310,353, Cl. 75-166.00B.
Nara, Akio; and Sasaya, Hideaki, to Nippon Soken, Inc. Filter element for liquid straining filter. 4,310,419, Cl. 210-493.400.
Nara, Takashi: *See*—
Iida, Takao; Shirahata, Kunikatsu; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,310,661, Cl. 536-17.00R.
Narazaki, Mitsutoshi, to Mikasa Chemical Industry Company, Limited; and Mitsubishi Chemical Industries Limited. Solidified emulsifiable concentrate and method for application thereof. 4,310,520, Cl. 424-200.000.
National Distillers & Chemical Corp.: *See*—
Muller, Werner C.; and Miller, Franklyn D., 4,310,629, Cl. 435-162.000.
National Identification Bureau, Inc.: *See*—
Jones, William R.; and Harrington, Edgar F., 4,309,904, Cl. 73-597.000.
National Institute for Researches in Inorganic Materials: *See*—
Mitomo, Mamoru; Kuramoto, Nobuyuki; and Inomata, Yoshizo, 4,310,499, Cl. 423-327.000.
National Mine Service Company: *See*—
Freed, Donald L., Jr.; and Baum, Gerald L., 4,310,199, Cl. 299-76.000.
National Research Development Corporation: *See*—
Hutchison, James M. S.; Sutherland, Robert J.; Edelstein, William A.; and Mallard, John R., 4,310,799, Cl. 324-319.000.
National Starch and Chemical Corporation: *See*—
Trubiano, Paolo C.; and Cohen, Aaron Y., 4,310,356, Cl. 106-25.000.
Negroni, Jean-Louis. Apparatus for determining the diameter of corrective lenses. 4,309,826, Cl. 33-200.000.
Nelson, Eric L., to Nelson Research & Development Company. Method of treatment of inflammation. 4,310,525, Cl. 424-244.000.
Nelson Research & Development Company: *See*—
Nelson, Eric L., 4,310,525, Cl. 424-244.000.
Nelson, Sharon L.: *See*—
Doster, Robert C.; and Nelson, Sharon L., 4,310,560, Cl. 426-285.000.
Nestor, Charles R.: *See*—
Cross, William E.; and Nestor, Charles R., 4,310,719, Cl. 174-94.00R.

Neu, Horst W.; Gilmore, Thomas; and McCann, Farrell A., to Northrop Corporation. Drill break-through sensor. 4,310,269, Cl. 408-11.000.

Neumann, Friedmund, to Schering Aktiengesellschaft. Combined antiestrogens and antigonadotropically effective antiandrogens for the prophylaxis and therapy of hyperplasia of the prostate. 4,310,523, Cl. 424-240.000.

Neuray, Dieter: *See*—
Margotte, Dieter; Nouvertne, Werner; Neuray, Dieter; and Vernaleken, Hugo, 4,310,642, Cl. 525-468.000.

Neville, William A.: *See*—
Buddemeyer, Bruce D.; Neville, William A.; and Bourne, Richard G., 4,310,561, Cl. 426-601.000.

NGK Spark Plug Co., Ltd.: *See*—
Takami, Akio; and Kondo, Kazuo, 4,310,598, Cl. 428-406.000.

Niehenke, Edward C.: *See*—
Buck, Daniel C.; Hess, Ricky D.; and Niehenke, Edward C., 4,310,809, Cl. 331-117.00D.

Nielsen, Henning H.: *See*—
Elkern, Kenneth E.; and Nielsen, Henning H., 4,310,746, Cl. 219-326.000.

Nielsen, Leif: *See*—
Nielsen, Ove; Nielsen, Leif; and Wanheim, Tarras, 4,309,885, Cl. 72-197.000.

Nielsen, Ove; Nielsen, Leif; and Wanheim, Tarras, to Aktieselskabet Nordiske Kabel- og Traadfabriker. Machine for forming a head on a shank, such as a nail or a screw. 4,309,885, Cl. 72-197.000.

Nihon Tsushin Gijyutsu Kabushiki Kaisha: *See*—
Asano, Kiyomitsu; and Watanabe, Tetsuo, 4,310,255, Cl. 400-171.000.

Nihra, Joseph A. Golf ball retriever. 4,310,189, Cl. 294-19.00A.

Niki, Shoji, to Takeda Riken Kogyo Kabushiki Kaisha. Frequency measuring apparatus. 4,310,891, Cl. 364-484.000.

Ninomiya, Kunihiro: *See*—
Kikumoto, Ryoji; Tobe, Akihiro; Fukami, Harukazu; Egawa, Mitsuo; and Ninomiya, Kunihiro, 4,310,534, Cl. 424-267.000.

Nippon Electric Co., Ltd.: *See*—
Asai, Koh, 4,310,827, Cl. 340-146.30E.
Tsujide, Tohru, 4,310,900, Cl. 365-190.000.

Nippon Electric Glass Company, Limited: *See*—
Matsuura, Ichiro; and Yamaguchi, Fumio, 4,310,357, Cl. 501-15.000.

Nippon Kogaku K.K.: *See*—
Maida, Osamu, 4,310,606, Cl. 429-93.000.
Motoori, Ryuzo, 4,310,230, Cl. 354-50.000.
Okuyama, Takeshi; Hozumi, Toshiaki; and Wakabayashi, Hiroshi, 4,310,233, Cl. 354-212.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Sano, Kazuo; Watanabe, Katsujiro; and Ando, Seigo, 4,309,902, Cl. 73-159.000.

Nippon Seiko Kabushiki Kaisha: *See*—
Ohkuma, Takeo; Furumura, Kyozaburo; Tanaka, Akihiko; and Shirota, Shinichi, 4,309,916, Cl. 74-467.000.

Nippon Sheet Glass Co., Ltd.: *See*—
Funaki, Masaaki; Yoshida, Motoaki; Inatomi, Haruo; Kuriyama, Ryozo; and Oshima, Taizo, 4,310,330, Cl. 8-506.000.

Nippon Soken, Inc.: *See*—
Morita, Masayuki; Kawaharazaki, Takashi; and Shimogawa, Toshiaki, 4,310,128, Cl. 242-107.000.
Nara, Akio; and Sasaya, Hideaki, 4,310,419, Cl. 210-493.400.

Nippon Steel Corporation: *See*—
Murakami, Syozo; Yamanaka, Hiroaki; Yokoyama, Kazuhiro; Yone, Yasuhiro; and Yamaguchi, Tokuzi, 4,310,412, Cl. 209-10.000.
Nitto, Hajime; Sakai, Kango; Shimokawa, Yasuo; and Saito, Katusi, 4,310,403, Cl. 204-206.000.

Nippon Telegraph & Telephone Public Corp.: *See*—
Ichimiya, Yoshichika; Sudo, Tsuneta; Maruyama, Hiromi; Sugamori, Shigeru; Sumida, Susumu; and Tokuno, Takashi, 4,310,802, Cl. 328-110.000.

Nippon Zeon Co., Ltd.: *See*—
Maeda, Akio; Hashimoto, Kinro; Inagami, Masaaki; and Fukushima, Hiroshi, 4,310,643, Cl. 525-468.000.

Nishikawa, Masao, to Honda Giken Kogyo Kabushiki Kaisha. Power steering device for vehicles. 4,310,063, Cl. 180-143.000.

Nishina, Yasuhide: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,310,564, Cl. 427-40.000.

Nishiyama, Ryuzo; Haga, Takahiro; Toki, Tadaaki; Koyanagi, Tohru; and Murai, Shigeo, to Ishihara Sangyo Kaisha Ltd. N-benzoyl N-pyridyloxy phenyl urea. 4,310,530, Cl. 424-263.000.

Nissan Motor Co., Ltd.: *See*—
Adachi, Masahiro, 4,310,871, Cl. 362-23.000.
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,309,919, Cl. 74-869.000.
Mochida, Haruo, 4,310,086, Cl. 192-111.00A.
Nozawa, Koji; Mizukoshi, Yukio; and Ikkatai, Mitsuo, 4,309,915, Cl. 74-339.000.
Sato, Yoshimi, 4,310,178, Cl. 280-802.000.
Tamura, Hideyuki, 4,309,973, Cl. 123-609.000.
Tsunoda, Masakazu; and Kawasaki, Teruo, 4,310,825, Cl. 340-52.00F.

Nissen, Axel; Kaibel, Gerd; Woerz, Otto; Arnold, Lothar; Braun, Manfred; and Rebafka, Walter, to BASF Aktiengesellschaft. Preparation of higher unsaturated ketones. 4,310,705, Cl. 568-391.000.

Nisshin Steel Co., Ltd.: *See*—
Kubota, Michio; Tsuda, Takeshi; Shimose, Masahiro; Takagi, Kazuhiro; Imamura, Yasuo; and Kato, Kazunori, 4,309,886, Cl. 72-202.000.

Nitro Nobel AB: *See*—
Ekman, Gunnar O.; and Granlund, Lars A., 4,310,364, Cl. 149-2.000.

Nitto, Hajime; Sakai, Kango; Shimokawa, Yasuo; and Saito, Katusi, to Nippon Steel Corporation. Apparatus for electrolytically treating a metal strip. 4,310,403, Cl. 204-206.000.

Niven, Rex C. G., to Gallagher Electronics Limited Company. Electric fence energizer output control circuits. 4,310,869, Cl. 361-232.000.

Nixdorf Computer Corporation: *See*—
Gehman, John T., 4,310,880, Cl. 364-200.000.

Noda, Taizo, to Kohshoh Limited. Belt holding device. 4,309,799, Cl. 24-315.000.

Nogaki, Hisami. Valve drive means for backwash filter valves. 4,310,144, Cl. 251-134.000.

Nomichi, Satoru: *See*—
Ichikawa, Shigeo; Nomichi, Satoru; and Sinoda, Masaki, 4,309,890, Cl. 72-368.000.

Nomura, Hirokazu: *See*—
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,310,564, Cl. 427-40.000.

Nomura, Shigenori; and Kano, Tetsuzo, to Sony Corporation. Educational apparatus with automatic terminal identification. 4,310,317, Cl. 434-319.000.

Nonnenmann, Manfred, to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG. Fluid-filled friction clutch. 4,310,084, Cl. 192-58.00B.

Norco Landscaping & Maintenance Co., Inc.: *See*—
Norleen, Kenneth V., 4,310,126, Cl. 242-47.000.

Norford, James R.: *See*—
Chiesa, Alan F.; Evans, David G.; Norford, James R.; and Zahorchak, John A., 4,309,971, Cl. 123-480.000.

Norleen, Kenneth V., to Norco Landscaping & Maintenance Co., Inc. Winding apparatus for plastic line. 4,310,126, Cl. 242-47.000.

Normandin, Marcel H., to Dextrous Engineering & Sales Corp. Apparatus for making paper clips. 4,310,032, Cl. 140-82.000.

Norota, Susumu: *See*—
Yamazaki, Yasuyuki; Emi, Shingo; Norota, Susumu; Takamatu, Kazuo; and Ono, Tomoyoshi, 4,310,594, Cl. 428-296.000.

Norris, Philip R., to Polaroid Corporation. Photographic apparatus with movable lens. 4,310,240, Cl. 355-54.000.

North American Philips Consumer Electronics Corporation: *See*—
Penird, Carl W.; and Puhak, Peter G., 4,310,779, Cl. 313-407.000.

Northern Telecom Limited: *See*—
Aujla, Sharanjit S.; and Lee, John D., 4,310,212, Cl. 339-97.00R.
Checkland, John A.; and Valois, Paul, 4,310,597, Cl. 428-383.000.
Fombellida, Miguel, 4,309,866, Cl. 57-15.000.

Northeved, Allan; and Fabrin, Knud C. C., to Medicoteknisk Institut, Svejsecentralen. Apparatus for providing an ultrasonic sectional view. 4,309,906, Cl. 73-612.000.

Northrop Corporation: *See*—
Neu, Horst W.; Gilmore, Thomas; and McCann, Farrell A., 4,310,269, Cl. 408-11.000.

Northwestern University: *See*—
Goldberg, Erwin, 4,310,456, Cl. 260-112.50R.

Nouvertne, Werner: *See*—
Margotte, Dieter; Nouvertne, Werner; Neuray, Dieter; and Vernaleken, Hugo, 4,310,642, Cl. 525-468.000.

Novotny, Raymond J., to Abex Corporation. Hammer for hammer mill. 4,310,125, Cl. 241-195.000.

Nozawa, Koji; Mizukoshi, Yukio; and Ikkatai, Mitsuo, to Nissan Motor Company, Limited. Automotive transmission. 4,309,915, Cl. 74-339.000.

NSK-Warner K.K.: *See*—
Morinaga, Masaru, 4,310,129, Cl. 242-107.40B.

Null, Charles: *See*—
Mitrzyk, Jan C., Sr.; Gossoo, Rodney W.; Fischer, Charles P.; Silvernail, Howard N.; and Null, Charles, 4,309,928, Cl. 83-161.000.

Obenour, Mary C.: *See*—
Fremont, Henry A.; Obenour, Mary C.; and Hedrick, Edward F., 4,310,424, Cl. 210-791.000.

O'Brien, John T. Wood splitter. 4,310,039, Cl. 144-193.00A.

Occidental Research Corporation: *See*—
Sadhukhan, Pasupati, 4,310,387, Cl. 202-175.000.

Odar, Larry F.: *See*—
Billington, Evans R.; and Odar, Larry F., 4,310,012, Cl. 137-75.000.

Odenwalder, Heinrich; Frank, Karl; and Muller, Reinhard, to AGFA-Gevaert Aktiengesellschaft. Photosensitive photographic material, a process for the production of photographic images, development baths and new hydroquinones. 4,310,621, Cl. 430-443.000.

Odintsova, Ekaterina N. Process for producing food vitamin concentrate from wine yeast. 4,310,553, Cl. 426-31.000.

Oechsner, Hans. System for removal of material from the surface of a sample. 4,310,759, Cl. 250-309.000.

Oerlikon-Buhrle U.S.A. Inc.: *See*—
Sarcia, Domenico S., 4,310,337, Cl. 62-6.000.

Oetiker, Alfred: *See*—
Mollet, Herbert; Oetiker, Alfred; and Boragine, Carlo, 4,310,617, Cl. 430-359.000.

Officine Savio S.p.A.: *See*—
Grossi, Oscar, 4,309,868, Cl. 57-124.000.

Ogasawara, Hiroomi. Device for detecting linear displacement. 4,310,806, Cl. 331-40.000.
Ogawa, Koichi: *See*—
Tanaka, Yoshinobu; Ogawa, Koichi; and Hioka, Minoru, 4,310,416, Cl. 210-321.300.
Ogura, Masahiro: *See*—
Hasegawa, Junzo; Ogura, Masahiro; Hamaguchi, Shigeki; Shimazaki, Masami; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,310,635, Cl. 435-146.000.
Ohio Agricultural Research and Development Center: *See*—
Keener, Harold M.; and Sciarini, Michael J., 4,310,770, Cl. 307-35.000.
Ohkuma, Takeo; Furumura, Kyozaburo; Tanaka, Akihiko; and Shirota, Shinichi, to Nippon Seiko Kabushiki Kaisha. Bearing apparatus for gear type power transmission system. 4,309,916, Cl. 74-467.000.
Ohmura, Kaoru; Shibasaki, Ichiro; Kimura, Takeo; and Kimura, Muneaki, to Asahi Kasei Kogyo Kabushiki Kaisha. Heat resistant photoresist composition and process for preparing the same. 4,310,641, Cl. 525-419.000.
Ohtsuka, Kunio: *See*—
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,309,919, Cl. 74-869.000.
Oien, Hal J., to Jordco, Inc. Dual-side aspirator for dental dam. 4,310,308, Cl. 433-91.000.
Oka, Hitoshi; Nakamura, Kenji; Yokono, Hitoshi; Isogai, Tokio; Matsuo, Akira; Miyazawa, Osamu; and Tanaka, Isamu, to Hitachi, Ltd. Method for automatically controlling composition of chemical copper plating solution. 4,310,563, Cl. 427-8.000.
Okachi, Ryo: *See*—
Iida, Takao; Shirahata, Kunikatsu; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,310,661, Cl. 536-17.00R.
Okada, Hitoshi: *See*—
Kikuchi, Masahiro; Okada, Hitoshi; Ihashi, Takao; and Kaji, Takeo, 4,310,912, Cl. 369-43.000.
Okada, Takeo: *See*—
Takeuchi, Koichi; Okada, Takeo; and Aoki, Shinichi, 4,310,736, Cl. 200-144.00B.
Okada, Toshiyuki, to Osaka Transformer Co., Ltd. A.C. Arc welder. 4,310,744, Cl. 219-130.510.
Okazaki, Isao: *See*—
Satoh, Hiroaki; Kokubu, Yoshikazu; Kitagawa, Kiyoshi; and Okazaki, Isao, 4,310,404, Cl. 204-252.000.
Okinaka, Yutaka; and Smith, Craig G., to Bell Telephone Laboratories, Incorporated. Electrolytic gold plating. 4,310,391, Cl. 204-46.00G.
Okumoto, Itsuo: *See*—
Uegai, Yoshiaki; Watanabe, Tsuyoshi; Shiota, Masashi; Okumoto, Itsuo; and Kayama, Naohiro, 4,310,533, Cl. 424-267.000.
Okutsu, Eiichi: *See*—
Onda, Shinzaburo; Okutsu, Eiichi; Itoh, Isamu; and Mifune, Hiroyuki, 4,310,622, Cl. 430-445.000.
Okuyama, Takeshi; Hozumi, Toshiaki; and Wakabayashi, Hiroshi, to Nippon Kogaku K.K. Film feed detecting device of a camera. 4,310,233, Cl. 354-212.000.
Olender, James P. Drive axle truss assembly. 4,310,200, Cl. 301-129.000.
Olin Corporation: *See*—
Boudakian, Max M., 4,310,671, Cl. 546-304.000.
Oliver, Robert J.; Lindblom, Kenneth J.; Idelman, Lloyd B.; and Medo, Carl S., to International Harvester Company. Remote control arrangement for flow rate valve. 4,310,026, Cl. 137-637.000.
Olsen, Everett O., to Foxboro Company, The. Signal handling apparatus. 4,310,841, Cl. 340-870.430.
Olson, Gary L.; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Synthesis of vitamin E and quinone intermediates. 4,310,465, Cl. 260-396.00R.
Olson, Norman F.; and Magee, Edward L., Jr., to Wisconsin Alumni Research Foundation. Preparation of cheese with microencapsulated enzymes. 4,310,554, Cl. 426-40.000.
Olson, Stanley E.: *See*—
Sheldrake, Leonard J.; Olson, Stanley E.; and Karau, Philip A., 4,310,793, Cl. 322-28.000.
Olsson, Lars E. G. Pneumatic-hydraulic tool, preferably for blind riveting. 4,310,056, Cl. 173-169.000.
Olympus Optical Co., Ltd.: *See*—
Kaneko, Nobutaka; and Kamachi, Shinichi, 4,310,407, Cl. 204-299.00R.
Terada, Masaaki, 4,310,228, Cl. 354-33.000.
Ombret, Rene: *See*—
Chaudot, Gerard; Ombret, Rene; and Zimmerman, Paul, 4,310,296, Cl. 431-5.000.
Onda, Shinzaburo; Okutsu, Eiichi; Itoh, Isamu; and Mifune, Hiroyuki, to Fuji Photo Film Co., Ltd. Photographic development process. 4,310,622, Cl. 430-445.000.
Ono, Kanji, to University of California, The Regents of the. Method and apparatus for analyzing selected material properties with magnetomechanical acoustic emissions. 4,309,903, Cl. 73-587.000.
Ono Pharmaceutical Co., Ltd.: *See*—
Uegai, Yoshiaki; Watanabe, Tsuyoshi; Shiota, Masashi; Okumoto, Itsuo; and Kayama, Naohiro, 4,310,533, Cl. 424-267.000.
Ono, Tomoyoshi: *See*—
Yamazaki, Yasuyuki; Emi, Shingo; Norota, Susumu; Takamatu, Kazuo; and Ono, Tomoyoshi, 4,310,594, Cl. 428-296.000.
Onodera, Hideo: *See*—
Toyomura, Yasuhiro; Fujisaki, Hitoshi; and Onodera, Hideo, 4,310,810, Cl. 332-31.00T.
Ooms, Julius; Retureau, Bernard; and Imbaud, Andre, to Procter & Gamble Company, The. Process for making transparent variegated soap bars. 4,310,479, Cl. 264-37.000.
Opderbeck, Rudolph G., to Wacker Corporation. Control mechanism for vibratory roller. 4,310,261, Cl. 404-117.000.
Opitz, Wolfgang: *See*—
Etschenberg, Eugen; Opitz, Wolfgang; and Raddatz, Siegfried, 4,310,517, Cl. 424-177.000.
Oquidam, Bernard, to Pechiney Ugine Kuhlmann. Process and apparatus for the preparation of hot water from solar energy. 4,309,982, Cl. 126-420.000.
Ormond, Robert E.: *See*—
Albers-Schonberg, George; Wallick, Hyman; Ormond, Robert E.; Miller, Thomas W.; and Burg, Richard W., 4,310,519, Cl. 424-181.000.
Ortofon Manufacturing A/S: *See*—
Hansen, Bjarne S.; Andersen, Knud H.; and Gudmandsen, Robert, 4,310,917, Cl. 369-170.000.
Osaka Transformer Co., Ltd.: *See*—
Okada, Toshiyuki, 4,310,744, Cl. 219-130.510.
Oshima, Taizo: *See*—
Funaki, Masaaki; Yoshida, Motoaki; Inatomi, Haruo; Kuriyama, Ryozo; and Oshima, Taizo, 4,310,330, Cl. 8-506.000.
Ostermayer, Franz: *See*—
Jaeggi, Knut A.; Ostermayer, Franz; and Schroter, Herbert, 4,310,527, Cl. 424-251.000.
Ostertag, Klaus: *See*—
Sick, Erwin; and Ostertag, Klaus, 4,310,250, Cl. 356-431.000.
Oswald, Alexis A.; and Mozeleski, Edmund J., to Exxon Research & Engineering Co. Alkyl aryl sulfonate esters. 4,310,471, Cl. 260-456.00P.
Otis Engineering Corporation: *See*—
Bourgoyne, Adam T., Jr., 4,310,050, Cl. 166-318.000.
Bourgoyne, Adam T., Jr., 4,310,058, Cl. 175-48.000.
Kohn, Gary A., 4,310,019, Cl. 137-553.000.
Outboard Marine Corporation: *See*—
Blanchard, Clarence E., 4,310,285, Cl. 416-134.00R.
DuBois, Chester G., 4,309,968, Cl. 123-187.50R.
Pearce, Richard E., 4,310,053, Cl. 172-20.000.
Owen, Peter; and Rees, John M., to Thorn EMI Limited. Lamp filament support. 4,310,782, Cl. 313-271.000.
Owens-Corning Fiberglas Corporation: *See*—
Shannon, Richard F., 4,310,585, Cl. 428-218.000.
Owens-Illinois, Inc.: *See*—
Richards, Raymond S., 4,310,342, Cl. 65-27.000.
Ozawa, Isao; Ito, Tomiyoshi; Hamada, Yoshiki; and Takeuchi, Isao. Halo-salicylanilide. 4,310,682, Cl. 560-142.000.
PA Incorporated: *See*—
Jennings, Charles E., 4,309,958, Cl. 118-306.000.
Pahl, Manfred H.: *See*—
Pisaric, Karl H.; Weber, Karl-Arnold; Traubel, Harro; Brauner, Dieter; and Pahl, Manfred H., 4,310,493, Cl. 422-135.000.
Palmer, John P., to General Dynamics, Pomona Division. Acoustical modulator for fiber optic transmission. 4,310,905, Cl. 367-140.000.
Pandeya, Arun K. Parallel processor having central processor memory extension. 4,310,879, Cl. 364-200.000.
Panetti, Romolo. Machine for truing the bearing surface of the rails of a railroad track. 4,309,847, Cl. 51-178.000.
Paoletti, Claude: *See*—
Le Pecq, Jean-Bernard; and Paoletti, Claude, 4,310,667, Cl. 546-70.000.
Pappas, Michael J.: *See*—
Buechel, Frederick F.; and Pappas, Michael J., 4,309,778, Cl. 3-1.911.
Parady, Edward D.: *See*—
Gelotte, Karl O.; and Parady, Edward D., 4,310,670, Cl. 546-257.000.
Parker-Hannifin Corporation: *See*—
Currie, William E., 4,309,892, Cl. 72-402.000.
Parker, James E., to General Motors Corporation. Tire pressure indicator integral with tire stem. 4,310,014, Cl. 137-227.000.
Parr, Erwin W.; and Brandt, Timothy B., to Parr Manufacturing Company. Check valve assembly. 4,310,018, Cl. 137-539.500.
Parr Manufacturing Company: *See*—
Parr, Erwin W.; and Brandt, Timothy B., 4,310,018, Cl. 137-539.500.
Parry, William T.: *See*—
Koran, Kenneth W.; and Parry, William T., 4,309,873, Cl. 60-646.000.
Parsons, David: *See*—
Jarvis, Roger P.; and Parsons, David, 4,310,080, Cl. 192-4.00B.
Pass, Reinhard: *See*—
Romey, Ingo; and Pass, Reinhard, 4,310,422, Cl. 210-769.000.
Pate, Harold T.; and Fochler, Helmut P., to Indian Head Inc. Wall drainage system. 4,309,855, Cl. 52-169.500.
Patel, Dilip C.; Stricklin, John D.; and Koehne, Bruno, to Magnetic Peripherals Inc. Cartridge loading and unloading mechanism. 4,310,864, Cl. 360-97.000.
Patel, Raman: *See*—
Coran, Aubert Y.; and Patel, Raman, 4,310,638, Cl. 525-183.000.
Patil, Arun A. Artificial intervertebral disc. 4,309,777, Cl. 3-1.910.
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Miroshnichenko, Alexandr P. Pipe resistance butt welding apparatus. 4,310,737, Cl. 219-59.100.

Patriark, Inc.: *See*—
Kennedy, John H., 4,310,028, Cl. 138-39.000.
Paulin, Esteban. Device for collecting fecal specimens. 4,309,782, Cl. 4-661.000.
Paulin, William P., to Canadian General Electric Company Limited. Electric kettle reservoir assembly. 4,310,748, Cl. 219-437.000.
Paulsen, Paul H.: *See*—
Edstrom, Gene H.; and Paulsen, Paul H., 4,310,895, Cl. 364-900.000.
Pauwels, Edward M., to Bendix Corporation, The. Adaptive traction pressure regulator. 4,310,201, Cl. 303-110.000.
Pavlin, Mark S., to Union Camp Corporation. Hydrogenation of α-pinene to cis-pinane. 4,310,714, Cl. 585-275.000.
Peacock, Richard A., to Wyle Laboratories. Data interface between rotating and nonrotating members. 4,310,767, Cl. 250-551.000.
Pearce, Richard E., to Outboard Marine Corporation. Sod cutoff mechanism. 4,310,053, Cl. 172-20.000.
Pechiney Ugine Kuhlmann: *See*—
Oquidam, Bernard, 4,309,982, Cl. 126-420.000.
Pellaux, Jean-Paul, to Cabloptic S.A. Process for manufacturing a device for coupling at least two light conductors and a coupling device according to this process. 4,310,216, Cl. 350-3.720.
Penird, Carl W.; and Puhak, Peter G., to North American Philips Consumer Electronics Corporation. Cathode ray tube shield-funnel connective means. 4,310,779, Cl. 313-407.000.
Pentanyl Technologies, Inc.: *See*—
Ruskan, Richard P.; Zafar, Humayon Z.; Goens, Duane N.; Hyatt, David E.; and Kenney, Charlie W., 4,310,490, Cl. 422-188.000.
Pepe, Joseph P.: *See*—
Fernandez, Jose M.; and Pepe, Joseph P., 4,310,618, Cl. 430-381.000.
Peppers, Norman A.: *See*—
Frohbach, Hugh F.; Macovski, Albert; Peppers, Norman A.; Siwecki, Thomas L.; and Schaefer, Louis F., 4,310,847, Cl. 358-54.000.
Perkins, Charles V.; and Firth, John R., to U.S. Philips Corporation. Monochromator. 4,310,244, Cl. 356-334.000.
Perkins, Corles M.: *See*—
Weilbach, August; Ragsdale, Charles W.; and Perkins, Corles M., 4,310,224, Cl. 351-23.000.
Peter, Wolfgang; and Hanke, Hans, to Daimler-Benz Aktiengesellschaft. Controllable drive for the auxiliary aggregates of internal combustion engines, especially of motor vehicle internal combustion engines. 4,310,321, Cl. 474-14.000.
Peters, Gary P.; Rowley, Robert L.; and Voyer, Peter E., to United Technologies Corporation. Rotor assembly having a multistage disk. 4,310,286, Cl. 416-198.00A.
Peters, Werner: *See*—
Huss, Rainer; and Peters, Werner, 4,310,395, Cl. 204-112.000.
Peterson, Harley G., to Joy Manufacturing Company. Filter bag attachment. 4,310,336, Cl. 55-377.000.
Peterson, John B., to Purdue Research Foundation. Method for evaluating moisture tensions of soils using spectral data. 4,310,758, Cl. 250-255.000.
Petigara, Ramesh B., to Rohm and Haas Company. 3-Isothiazolones as biocides. 4,310,590, Cl. 424-270.000.
Petrolite Corporation: *See*—
Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,310,472, Cl. 260-465.400.
Pfau, Jean, to Ateliers des Charmilles, S.A. EDM Process and apparatus for machining cavities and slots in a workpiece. 4,310,742, Cl. 219-69.00M.
Pfizer Inc.: *See*—
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,310,529, Cl. 424-263.000.
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,310,668, Cl. 546-204.000.
Althuis, Thomas H.; Harbert, Charles A.; Johnson, Michael R.; and Melvin, Lawrence S., Jr., 4,310,669, Cl. 546-206.000.
Wolff, John S., III; Hemsworth, George R.; and Jensen, Keith E., 4,310,550, Cl. 424-365.000.
Pfleiderer, Ernst: *See*—
Monsheimer, Rolf; and Pfleiderer, Ernst, 4,310,328, Cl. 8-94.160.
Phares, Richard F.: *See*—
Clifton, Robert D.; and Phares, Richard F., 4,310,883, Cl. 364-200.000.
Phillips Petroleum Company: *See*—
Eastman, Alan D.; and Kolts, John H., 4,310,717, Cl. 585-661.000.
Horton, Robert L., 4,309,898, Cl. 73-23.100.
McKay, Dwight L., 4,310,410, Cl. 208-120.000.
Stumpe, Nelson A., Jr., 4,310,582, Cl. 428-182.000.
Wilkening, Gregory C., 4,310,411, Cl. 208-153.000.
Phillips, Samuel B., Jr.; and Cochran, John M., to Phillips Textile Marketing Co., Inc. Apparatus for monitoring the blend of fibers. 4,310,060, Cl. 177-70.000.
Phillips Textile Marketing Co., Inc.: *See*—
Phillips, Samuel B., Jr.; and Cochran, John M., 4,310,060, Cl. 177-70.000.
Pickett, David A., to Allied Corporation. Belt clamping apparatus with self-aligning feature. 4,310,175, Cl. 280-801.000.
Pierpaoli, Walter. Combination of drugs and a method for the selective control of the immune reactions evoked in a host by the administration of antigens. 4,310,535, Cl. 424-273.00R.
Pierrat, Jean, to Avions Marcel Dassault-Breguet Aviation. Sighting device for rear firing on combat aircraft. 4,310,851, Cl. 358-109.000.
Pierson, Joseph E.: *See*—
Beall, George H.; and Pierson, Joseph E., 4,310,595, Cl. 428-332.000.
Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See*—
Ito, Akio; and Ito, Masao, 4,310,259, Cl. 401-265.000.
Pindras, Udo: *See*—
Schwing, Gerhard; and Pindras, Udo, 4,310,124, Cl. 241-46.110.
Pinsky, Jules: *See*—
Cooper, Scott A.; Shetty, Ramakrishna; and Pinsky, Jules, 4,310,584, Cl. 428-212.000.
Pipe Systems, Incorporated: *See*—
Campbell, Steve, 4,310,184, Cl. 285-238.000.
Pippert, Aaron J., to Utex Industries, Inc. Anti-extrusion seals and packings. 4,310,163, Cl. 277-188.00A.
Pirelli/Furlanis Applicazioni: *See*—
Calza, Francesco; and Borca, Bruno, 4,310,262, Cl. 405-87.000.
Pisaric, Karl H.; Weber, Karl-Arnold; Traubel, Harro; Brauner, Dieter; and Pahl, Manfred H., to Bayer Aktiengesellschaft. Apparatus for the mixing and application of reactive materials. 4,310,493, Cl. 422-135.000.
Pitchford, Robert J. Electrical control for trim/tilt of dual outboard or stern drives. 4,310,320, Cl. 440-61.000.
Pitney Bowes Inc.: *See*—
Check, Frank T., Jr., 4,310,720, Cl. 178-22.080.
Check, Frank T., Jr., 4,310,754, Cl. 235-454.000.
Check, Frank T., Jr.; and Sansone, Ronald P., 4,310,757, Cl. 250-236.000.
Miller, Roland G., 4,310,755, Cl. 250-214.00R.
Planatolwerk W. Hesselmann, Chemische und Maschinenfabrik fur Klebetechnik: *See*—
Hesselmann, Karlheinz; Tschiers, Bernhard; and Ertl, Ludwig, 4,310,576, Cl. 427-428.000.
Platmanufaktur AB: *See*—
Bondeson, Leif S.; and Edner, Stig F., 4,310,089, Cl. 198-530.000.
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Polycyclic nitrogen-containing compounds. 4,310,345, Cl. 71-76.000.
Plow, Arthur E., to TK Valve & Manufacturing, Inc. Grease fitting cap. 4,310,071, Cl. 184-88.00R.
Plunguian, Mark: *See*—
Cornwell, Charles E.; and Plunguian, Mark, 4,310,486, Cl. 264-309.000.
Pockell, Herman L.: *See*—
Harding, Phillip A.; Chong, Carlos F.; and Pockell, Herman L., 4,310,901, Cl. 365-200.000.
Poetsch, Dieter, to Robert Bosch GmbH. Method and apparatus for the television scanning of films. 4,310,856, Cl. 358-214.000.
Pogonowski, Ivo C., to Texaco Inc. Double action, self-contained swages for joining two small tubes. 4,309,891, Cl. 72-399.000.
Polaroid Corporation: *See*—
Foley, James W.; Locatell, Louis, Jr.; and Zepp, Charles M., 4,310,673, Cl. 548-207.000.
Norris, Philip R., 4,310,240, Cl. 355-54.000.
Zinchuk, Michael, 4,310,227, Cl. 354-25.000.
Polgari, Istvan: *See*—
Hajos, Andor; Fekete, Marton; Kurti, Marianna; Lang, Tibor; Toldy, Lajos; Borvendeg, Janos; Nagy, Laszlo; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,310,549, Cl. 424-330.000.
Ponpipom, Mitree M.: *See*—
Baldeschwieler, John D.; Gamble, Ronald C.; Mauk, Marcia R.; Shen, Tsung-Ying; and Ponpipom, Mitree M., 4,310,505, Cl. 424-1.000.
Posipanko, Thomas: *See*—
Felter, Richard E.; Emmons, Larrimore B.; Eshbach, John R., Jr.; and Posipanko, Thomas, 4,310,581, Cl. 428-109.000.
PPG Industries, Inc.: *See*—
Martin, Walter L., Jr., 4,310,602, Cl. 428-596.000.
Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co.: *See*—
Steigerwald, Wolf-Erhard, 4,310,824, Cl. 338-174.000.
Prevorsek, Dusan C.: *See*—
DeBona, Bruce T.; and Prevorsek, Dusan C., 4,310,652, Cl. 528-125.000.
Price, Byron F.: *See*—
Hibbitts, Charles H.; Price, Byron F.; Cogbill, Everett C.; Kelly, James G.; and Glass, James E., 4,310,006, Cl. 131-290.000.
Price, Edison A., to Edison Price, Incorporated. Universally adjustable lamp fixture. 4,310,875, Cl. 362-277.000.
Pritchard, James L. Interferometer system. 4,310,245, Cl. 356-345.000.
Pritt, Donald S. Flexible athletic shoe. 4,309,831, Cl. 36-3.00B.
Procter & Gamble Company, The: *See*—
Choy, Clement K.; and Greene, Robert A., 4,310,434, Cl. 252-174.210.
Ooms, Julius; Retureau, Bernard; and Imbaud, Andre, 4,310,479, Cl. 264-37.000.
Stiros, Paul, 4,310,433, Cl. 252-132.000.
Productronix, Inc.: *See*—
Budraitis, Tadas; and Seliga, Gerald W., 4,309,907, Cl. 73-771.000.
Produits Chimiques Ugine Kuhlmann: *See*—
Arsac, Aime J.; and Frank, Pierre, 4,310,331, Cl. 8-527.000.
Cheminal, Bernard; Kiener, Paul; and Traversaz, Aime, 4,310,697, Cl. 564-479.000.
Prommel, Gunther: *See*—
Mank, Klaus-Dieter; and Prommel, Gunther, 4,310,789, Cl. 318-587.000.

Prulamp, Helmut: *See—*
Althuber, Horst; and Prulamp, Helmut, 4,310,131, Cl. 242-204.000.
Puhak, Peter G.: *See—*
Penird, Carl W.; and Puhak, Peter G., 4,310,779, Cl. 313-407.000.
Punja, Nazim: *See—*
Costain, Winston; Terry, Bernard W. H.; Punja, Nazim; and Cleare, Peter J. V., 4,310,464, Cl. 260-343.600.
Purdue Research Foundation: *See—*
Peterson, John B., 4,310,758, Cl. 250-255.000.
PYE (Electronic Products) Limited: *See—*
Branson, John, 4,310,047, Cl. 165-64.000.
Quanta-Ray, Inc.: *See—*
Byer, Robert L.; and Herbst, Richard L., 4,310,808, Cl. 331-94.50C.
Quick-Set, Incorporated: *See—*
Mooney, Paul C., 4,310,136, Cl. 248-278.000.
R.G.B. Laboratories, Inc.: *See—*
Buddemeyer, Bruce D.; Neville, William A.; and Bourne, Richard G., 4,310,561, Cl. 426-601.000.
Raa, Jan; Strom, Terje; Tidemann, Even; and Eide, Ola, to Fiskeriteknologisk Forskningsinstitutt. Method for the separation of fat, pigments and entrail remains from fish raw material. 4,309,794, Cl. 17-46.000.
Rabiger, Jurgen: *See—*
Seeger, Arnold; Schalt, Wilfried; and Rabiger, Jurgen, 4,310,787, Cl. 318-85.000.
Rabilloud, Guy; and Sillion, Bernard, to Institut Francais du Petrole. Process for synthesizing bis (phenylglyoxyloyl)benzenes usable for manufacturing polyphenylquinoxaline resins. 4,310,699, Cl. 568-315.000.
Raddatz, Siegfried: *See—*
Etschenberg, Eugen; Opitz, Wolfgang; and Raddatz, Siegfried, 4,310,517, Cl. 424-177.000.
Radiation Dynamics, Inc.: *See—*
Berejka, Anthony J., 4,310,367, Cl. 156-85.000.
Radichio, Arthur, to D'Agostino, Gerald M., a part interest. Pipe freezer or the like. 4,309,875, Cl. 62-66.000.
Ragard, Phillip A.: *See—*
Dean, Weibley J.; Holmes, Robert H.; and Ragard, Phillip A., 4,309,808, Cl. 29-566.300.
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, to American Cyanamid Co. Synthesis of intermediates for tetramisole, levamisole and their derivatives. 4,310,672, Cl. 548-155.000.
Ragsdale, Charles W.: *See—*
Weilbach, August; Ragsdale, Charles W.; and Perkins, Corles M., 4,310,224, Cl. 351-23.000.
Rahm, Jurg; and Waltz, Lothar, to Hoffmann-La Roche Inc. Sample or reagent container for analyzers. 4,310,488, Cl. 422-102.000.
Raines, Kenneth, to Burron Medical Inc. Backflow check valve for use with IV administration sets. 4,310,017, Cl. 137-533.000.
Ralston Purina Company: *See—*
Khayat, Ali; and Redenz, Klaus P., 4,310,575, Cl. 427-409.000.
Nahm, Lee J., Jr., 4,310,558, Cl. 426-98.000.
Rancourt, James D.: *See—*
Temple, Michael D.; Rancourt, James D.; and Anthon, Erik W., 4,310,783, Cl. 313-474.000.
Randolph, Arthur J. Automatically controlled wind propeller and tower shadow eliminator. 4,310,284, Cl. 416-132.00B.
Rapp, Christoph; and Mikulecki, Karl, to Hottinger Baldwin Measurements, Inc. Liquid filled pressure transducer. 4,309,908, Cl. 73-720.000.
Raser, Richard A.; and Raser, William H. Bellowslike thermodynamic reciprocating apparatus. 4,309,872, Cl. 60-517.000.
Raser, William H.: *See—*
Raser, Richard A.; and Raser, William H., 4,309,872, Cl. 60-517.000.
Rasmussen, David H.; and Lee, Richard H., to AG-BAG Corporation. Tunnel clean out mechanism for an agricultural bag loading apparatus. 4,310,036, Cl. 141-114.000.
Rastogi, Laxmi K., to Measurex Corporation. Method of controlling the opacity of the exhaust of the combustion of solid fuel and air in a furnace. 4,309,949, Cl. 110-341.000.
Ratcliffe, Ronald W.: *See—*
Christensen, Burton G.; and Ratcliffe, Ronald W., 4,310,538, Cl. 424-274.000.
Rationator-Maschinenbau GmbH: *See—*
Schindel, Hugo, 4,309,820, Cl. 29-785.000.
Ravaglia, Andrea: *See—*
Daniele, Vincenzo; Corda, Giuseppe; Ravaglia, Andrea; and Ferla, Giuseppe, 4,310,571, Cl. 427-102.000.
Raychem Corporation: *See—*
Szalvay, Laszlo, 4,310,183, Cl. 285-114.000.
Raychem Limited: *See—*
Hill, Frederick W. L.; and Clabburn, Robin J. T., 4,309,807, Cl. 29-446.000.
Raymond, Charles, to Anchor Machine & Manufacturing, Inc. Apparatus for shaking fish free from gillnets, longlines and similar fish capturing means. 4,309,837, Cl. 43-8.000.
Raytheon Company: *See—*
Schwerdt, Kurt R., 4,310,839, Cl. 340-712.000.
Sharp, David A.; and Salisbury, David J., 4,309,786, Cl. 9-8.00R.
RCA Corporation: *See—*
Bowman, David F., 4,310,814, Cl. 333-121.000.
Gunter, John, 4,310,915, Cl. 369-251.000.
Miller, Michael E., 4,310,913, Cl. 369-43.000.
Riddle, George H. N., 4,310,914, Cl. 369-43.000.
Sheng, Ping, 4,310,910, Cl. 369-116.000.
Rebafka, Walter, to BASF Aktiengesellschaft. Manufacture of but-2-en-1-ol compounds by isomerizing the corresponding but-3-en-1-ol compounds. 4,310,709, Cl. 568-687.000.
Rebafka, Walter: *See—*
Nissen, Axel; Kaibel, Gerd; Woerz, Otto; Arnold, Lothar; Braun, Manfred; and Rebafka, Walter, 4,310,705, Cl. 568-391.000.
Rechmeier, Gerhard H.: *See—*
Legutke, Gunter; Rechmeier, Gerhard H.; Scholz, Harald; Schuchardt, Kurt; Holler, Ernst; and Liesenfelder, Gunther, 4,310,713, Cl. 570-243.000.
Reclamet, Inc.: *See—*
Dudley, Robert H.; Areaux, Larry D.; and Dudley, Russell D., 4,310,417, Cl. 210-375.000.
Redenz, Klaus P.: *See—*
Khayat, Ali; and Redenz, Klaus P., 4,310,575, Cl. 427-409.000.
Reed, Richard F. Photographic apparatus and method for adding artificial backgrounds. 4,310,232, Cl. 354-125.000.
Rees, John M.: *See—*
Owen, Peter; and Rees, John M., 4,310,782, Cl. 313-271.000.
Rego Company: *See—*
Billington, Evans R.; and Odar, Larry F., 4,310,012, Cl. 137-75.000.
Reh, Lothar; Schmidt, Hans W.; Sauer, Harald; Winkhaus, Gunter; Thome, Roland; and Moritz, Dieter, to Metallgesellschaft A.G.; and Vereinigte Aluminium Werke A.G. Process for producing hydrogen fluoride. 4,310,501, Cl. 423-484.000.
Reichert, Paul W.: *See—*
Knight, Leland W., 4,309,779, Cl. 4-144.300.
Reichman, Steven H.: *See—*
Fountain, Richard W.; Boesch, William J.; and Reichman, Steven H., 4,310,354, Cl. 75-211.000.
Reilly, Philip C., Jr.; and Battersby, Charles D. Medication dispenser. 4,310,103, Cl. 221-15.000.
Reimschuessel, Herbert K.; and DeBona, Bruce T., to Allied Corporation. Polymers of p-(1,1-dimethyl-2-hydroxyethyl)benzoic acid and preparation thereof. 4,310,655, Cl. 528-176.000.
Reiners, Robert A., to CPC International Inc. Extraction of oil from vegetable materials. 4,310,468, Cl. 260-412.400.
Reinhard, Russell R.: *See—*
Dorawala, Tansukhlal G.; Reinhard, Russell R.; and Kerr, Edwin R., 4,310,715, Cl. 585-487.000.
Reischl, Artur, to Bayer Aktiengesellschaft. Process for the preparation of stable ionic dispersions. 4,310,448, Cl. 260-29.6NR.
Reischl, Artur, to Bayer Aktiengesellschaft. Process for the preparation of stable dispersions. 4,310,449, Cl. 260-29.6NR.
Reissenweber, Gernot; and Mangold, Dietrich, to BASF Aktiengesellschaft. Preparation of alkyl anthranilates. 4,310,677, Cl. 560-22.000.
Reliance Electric Company: *See—*
Loshbough, Richard C., 4,310,893, Cl. 364-567.000.
Research Corporation: *See—*
Bahl, Om P., 4,310,455, Cl. 260-112.00B.
Kjelgaard, William L.; and Anderson, Paul M., 4,310,344, Cl. 71-61.000.
Kjelgaard, William L.; and Anderson, Paul M., 4,310,555, Cl. 426-69.000.
Resener, Baird E., to Western Electric Company, Inc. Selector switch with common actuator both for circuit selection and for selection indication. 4,310,729, Cl. 179-90.00R.
Resonant Technology Company: *See—*
Gurries, Raymond A.; and Stormon, Harry J., 4,310,054, Cl. 172-40.000.
Resource Control, Incorporated: *See—*
Smith, Avery B.; and Hayes, Mark J., 4,310,406, Cl. 204-275.000.
Retureau, Bernard: *See—*
Ooms, Julius; Retureau, Bernard; and Imbaud, Andre, 4,310,479, Cl. 264-37.000.
Rexnord Inc.: *See—*
Mueller, Erwin R., 4,309,893, Cl. 72-455.000.
Rey, Fredy, to LGZ Landis & Gyr Zug AG. Transmitting device for communications equipment for generating a signal to be superimposed on an AC power supply network. 4,310,829, Cl. 340-310.00A.
Rice, Warren A.; Vinton, Clarence S.; Franklin, Charles H.; and Torbett, Christopher J., to Fluorocarbon Company, The. Method and apparatus utilizing a porous vitreous carbon body particularly for fluid heating. 4,310,747, Cl. 219-381.000.
Rich, Roger K.; and Testerman, Charles B., to Textron Inc. Threaded fastener and structural joint attained therewith. 4,310,272, Cl. 411-185.000.
Richards, Raymond S., to Owens-Illinois, Inc. Method and apparatus for preheating pulverous materials at reduced pressure prior to their introduction into a melting furnace. 4,310,342, Cl. 65-27.000.
Richardson-Merrell, Inc.: *See—*
Wiech, Norbert L.; and Ursillo, Richard C., 4,310,524, Cl. 424-244.000.
Richaud, Louis, to Comsip Entreprise. Monitoring device for regulating any sequence of automatic operations in an industrial plant. 4,310,877, Cl. 364-159.000.
Richman, David W.: *See—*
Rose, Alan L.; and Richman, David W., 4,310,408, Cl. 204-301.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Jovanovics, Karola; and Gorog, Sandor, 4,310,528, Cl. 424-262.000.
Rickert, Leonard R.; and Rickert, Russell L. Commutator brush tool. 4,309,920, Cl. 81-3.00R.
Rickert, Russell L.: *See—*
Rickert, Leonard R.; and Rickert, Russell L., 4,309,920, Cl. 81-3.00R.

Ricoh Co., Ltd.: *See—*
Asano, Kiyomitsu; and Watanabe, Tetsuo, 4,310,255, Cl. 400-171.000.
Fujimoto, Sakae, 4,310,151, Cl. 271-11.000.
Horike, Masanori, 4,310,846, Cl. 346-75.000.
Kikuchi, Hideo, 4,310,153, Cl. 271-259.000.
Mochizuki, Manabu; Miyakawa, Seiichi; Kimura, Taro; and Hashimoto, Junichiro, 4,310,238, Cl. 355-14.00D.
Sakai, Katsuo, 4,310,610, Cl. 430-42.000.
Takahashi, Shuichi; and Kondo, Mitsuru, 4,310,859, Cl. 358-304.000.

Riddle, George H. N., to RCA Corporation. Skipper-assisted active search. 4,310,914, Cl. 369-43.000.

Rieber, Norbert: *See—*
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,310,345, Cl. 71-76.000.

Riesen, Peter, to Sulzer Brothers Ltd. Patterning device for a warp knitting machine. 4,309,880, Cl. 66-207.000.

Riessberger, Klaus: *See—*
Theurer, Josef; and Riessberger, Klaus, 4,309,846, Cl. 51-5.00B.

Rignon, Maurice: *See—*
Malafosse, Jean; and Rignon, Maurice, 4,310,394, Cl. 204-82.000.

Riley, H. John, to S. W. Hart & Co. Pty. Ltd. Roof assembly. 4,309,988, Cl. 126-450.000.

Rion Co., Ltd.: *See—*
Takinishi, Kiyotoshi; and Iwasaki, Shingi, 4,310,002, Cl. 128-642.000.

Rivercross Learning Corp.: *See—*
Carlson, Albert W. D., 4,310,318, Cl. 434-339.000.

Rivertz, Johan A., to A/S Hoyer-Ellefsen. Offshore structure for production of hydrocarbons. 4,310,052, Cl. 166-362.000.

Robbins, William E.: *See—*
Hunt, LaWanda M.; Thompson, Malcolm J.; and Robbins, William E., 4,310,547, Cl. 424-325.000.

Robert Bosch GmbH: *See—*
Leiner, Hans-Richard, 4,310,860, Cl. 360-40.000.
Poetsch, Dieter, 4,310,856, Cl. 358-214.000.
Schmitt, Jakob; and Voit, Willy, 4,309,815, Cl. 29-596.000.
Stahl, Roland, 4,310,401, Cl. 204-195.00S.
Wanner, Karl; Thome, Ludwig; Faelchle, Joerg; and Lehmann, Werner, 4,310,055, Cl. 173-118.000.

Roberts, F. Alexander; Stiles, William V.; Cosbey, Robert C.; and Duncan, John P., to Chevron Research Company. Microcomputer-controlled portable satellite signal simulator for exploration systems, and method of use. 4,310,884, Cl. 364-578.000.

Robinson, James S. Apparatus for transferring cargo between relatively movable bodies. 4,310,277, Cl. 414-139.000.

Robinson, Robert K.: *See—*
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Roche, Marcel; and Litot, Jean P., to Thomson-CSF. Method of making Schottky diode with an improved voltage behavior. 4,310,362, Cl. 148-1.500.

Rockwell International Corporation: *See—*
McKee, Donald E., 4,310,807, Cl. 331-65.000.
Wagner, Ross I., 4,310,502, Cl. 423-579.000.

Rogers, Lloyd W., Jr.; and Stephenson, Robert L., to General Motors Corp.; and Allied Corporation. Locking junction ring for continuous-loop passive seat belt system. 4,310,177, Cl. 280-802.000.

Rogers, Lloyd W., Jr.: *See—*
Winnale, James A.; Rogers, Lloyd W., Jr.; Compeau, Edward E.; and Billis, Albert E., 4,310,179, Cl. 280-803.000.

Rogic, Milorad M.: *See—*
Masilamani, Divakaran; and Rogic, Milorad M., 4,310,702, Cl. 568-348.000.

Rohm GmbH: *See—*
Monsheimer, Rolf; and Pfleiderer, Ernst, 4,310,328, Cl. 8-94.160.

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Kilbourn, Edward E.; and Weir, W. David, 4,310,537, Cl. 424-300.000.
Petigara, Ramesh B., 4,310,590, Cl. 424-270.000.

Rokuta, Satoru: *See—*
Mita, Kou; Rokuta, Satoru; Takada, Kiyoshi; and Suzuki, Fuziko, 4,310,559, Cl. 426-101.000.

Rolinski, Edmund J.; and Laub, Bernard, to United States of America, Air Force. Heat transfer calibration plate. 4,309,901, Cl. 73-147.000.

Roll, William D., to University of Toledo, The. Methods and piperidinyl-alkyl-benzamide composition for inhibiting H_2 histamine receptors. 4,310,532, Cl. 424-267.000.

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Colley, Rowan H., 4,310,768, Cl. 290-1.00C.

Romeo, Ciriaco: *See—*
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Romey, Ingo; and Pass, Reinhard, to Bergwerksverband GmbH. Method of processing and recirculating filtration residues. 4,310,422, Cl. 210-769.000.

Rosa, Nicola, to Societa Italiana Telecomunicazioni Siemens S.p.A. Peak-level detector for digitized signals in PCM telecommunication system. 4,310,921, Cl. 370-13.000.

Rosch, Gunter: *See—*
Erckel, Rudiger; and Rosch, Gunter, 4,310,665, Cl. 542-435.000.

Rose, Alan L.; and Richman, David W., to McDonnell Douglas Corporation. Electrophoresis chamber. 4,310,408, Cl. 204-301.000.

Rosenberg, William D.: *See—*
Howard, James K.; Rosenberg, William D.; and White, James F., 4,310,568, Cl. 427-84.000.

Rosewell, Michael P. Emergency deployable core catcher. 4,310,385, Cl. 376-280.000.

Ross, Robert R.: *See—*
Fleming, Mills L.; Fuchs, George L.; Gladden, Robert H., Jr.; and Ross, Robert R., 4,310,209, Cl. 339-14.00R.

Rossetti, Alan E.: *See—*
Kreft, Keith A.; Rossetti, Alan E.; and Lynn, Michael F., 4,309,900, Cl. 73-117.200.

Rosso, Paul D.: *See—*
Berglund, Claire A.; and Rosso, Paul D., 4,310,509, Cl. 424-28.000.

Roth, Christian: *See—*
Bauer, Kurt; Hesch, Georg; Huber, Hans; Markert, Helmut; and Roth, Christian, 4,309,790, Cl. 15-250.420.

Roussel, Michel: *See—*
Mimoun, Hubert; Charpentier, Robert; and Roussel, Michel, 4,310,704, Cl. 568-385.000.

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Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,310,542, Cl. 424-304.000.

Rowley, Robert L.: *See—*
Peters, Gary P.; Rowley, Robert L.; and Voyer, Peter E., 4,310,286, Cl. 416-198.00A.

Rucker, Norbert; Sellschopp, Michael; and Fuchs, Hans-Ullrich, to W. C. Heraeus GmbH. Strain gauge strip element and method of its manufacture. 4,310,823, Cl. 338-2.000.

Ruh, Wolf D.: *See—*
Brunsch, Arwed; Ruh, Wolf D.; Schneider, Jochen; and Trippel, Gerhard, 4,310,798, Cl. 324-209.000.

Ruhrchemie Aktiengesellschaft: *See—*
Schmidt, Volkmar; Lieder, Bernhard; Scheve, Heinrich; and Dohren, Hans, 4,310,333, Cl. 48-77.000.

Ruskan, Richard P.; Zafar, Humayon Z.; Goens, Duane N.; Hyatt, David E.; and Kenney, Charlie W., to Pentanyl Technologies, Inc. Apparatus for enriching the iron carbonyl content of a recycle gas stream. 4,310,490, Cl. 422-188.000.

Rutner, Herman: *See—*
Akerkar, Anandrao S.; and Rutner, Herman, 4,310,675, Cl. 548-336.000.

Ryan, Kelly P., to Blair Manufacturing Company. Cattle feeding device. 4,310,252, Cl. 366-186.000.

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Yamasaki, Tatsuya, 4,310,127, Cl. 242-84.10J.

Ryon, Donald C., to Motorola, Inc. Input activated frequency synthesizer. 4,310,804, Cl. 331-1.00A.

S. W. Hart & Co. Pty. Ltd.: *See—*
Riley, H. John, 4,309,988, Cl. 126-450.000.

Sacco, Susan M. Vaginal irrigation apparatus. 4,309,995, Cl. 128-239.000.

Sachse, Erhard. Sheeting of multilayer antidrumming lining material. 4,310,580, Cl. 428-109.000.

Sada, Eizo; Katoh, Shigeo; Toei, Ryozo; and Michiki, Hideyuki, to Toyo Engineering Corporation. Stirring method. 4,310,253, Cl. 366-273.000.

Sadhukhan, Pasupati, to Occidental Research Corporation. Process and system of desalination by direct contact heat transfer. 4,310,387, Cl. 202-175.000.

Saito, Isao: *See—*
Sakamoto, Seiya; Saito, Isao; Hirosawa, Makoto; and Hohki, Tetsuo, 4,310,234, Cl. 354-298.000.

Saito, Katusi: *See—*
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Saito, Muneo: *See—*
Konishi, Hideki; Sugawara, Michiaki; and Saito, Muneo, 4,310,420, Cl. 210-659.000.

Sakaguchi, Mitsuo, to Kobishi America, Inc. Electrically-energized horn. 4,310,833, Cl. 340-384.00E.

Sakai, Kango: *See—*
Nitto, Hajime; Sakai, Kango; Shimokawa, Yasuo; and Saito, Katusi, 4,310,403, Cl. 204-206.000.

Sakai, Katsuo, to Ricoh Company, Ltd. Two color electrostatographic process. 4,310,610, Cl. 430-42.000.

Sakamoto, Kiichiro: *See—*
Hamada, Shinji; and Sakamoto, Kiichiro, 4,310,616, Cl. 430-309.000.

Sakamoto, Masakatsu; Uchida, Kenji; Kamino, Yukishige; and Saito, Makoto, to Hitachi, Ltd. Apparatus for supplying raw liquid and relieving pressure of high-pressure product liquid. 4,310,491, Cl. 422-234.000.

Sakamoto, Seiya; Saito, Isao; Hirosawa, Makoto; and Hohki, Tetsuo, to Dainippon Screen Seizo Kabushiki Kaisha. Supplementary amount of developing solution determining method for a film developer. 4,310,234, Cl. 354-298.000.

Sakamoto, Shoji. Attachment for a magnetic needle assembly for vehicles. 4,309,828, Cl. 33-355.00R.

Sakharnov, Vasily A.: *See*—
Paton, Boris E.; Lebedev, Vladimir K.; Kuchuk-Yatsenko, Sergei I.; Sakharnov, Vasily A.; Galyan, Boris A.; and Miroshnichenko, Alexandr P., 4,310,737, Cl. 219-59.100.
Sakuma, Shinzo; and Warabi, Junichi, to Kabushiki Kaisha Meidensha; and Gemvac. Arc-shield supporting structure of a vacuum power interrupter. 4,310,735, Cl. 200-144.00B.
Sakurai, Soichi; Fukuda, Kyohei; and Takata, Masanobu, to Hitachi, Ltd. Magnetic focusing structure for three in-line gun type color picture tubes. 4,310,780, Cl. 313-412.000.
Salisbury, David J.: *See*—
Sharp, David A.; and Salisbury, David J., 4,309,786, Cl. 9-8.00R.
Salomon, Georges P. J. Ski binding and boot. 4,309,833, Cl. 36-117.000.
Samel, Ulf-Rainer: *See*—
Platz, Rolf; Fuchs, Werner; Rieber, Norbert; Samel, Ulf-Rainer; Jung, Johann; and Wuerzer, Bruno, 4,310,345, Cl. 71-76.000.
Samuelsson, Mokjas J., to Josam Lastbilteknik AB. Arrangement for straightening damaged vehicle bodies. 4,309,895, Cl. 72-457.000.
Sanders Associates, Inc.: *See*—
Baer, Ralph H., 4,310,854, Cl. 358-143.000.
Ballard, Samuel S.; and White, Ronald P., 4,310,904, Cl. 367-131.000.
Fuller, Harrison W., 4,310,816, Cl. 333-156.000.
Sanders, James M.: *See*—
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,310,681, Cl. 560-120.000.
Sanford, James L.: *See*—
Lillie, James B.; and Sanford, James L., 4,310,868, Cl. 361-154.000.
Sano, Kazuo; Watanabe, Katsujiro; and Ando, Seigo, to Nippon Kokan Kabushiki Kaisha. Method for continuously measuring steepness of defective flatness of metal strip during rolling. 4,309,902, Cl. 73-159.000.
Sansone, Ronald P.: *See*—
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Santen, Sven, to SKF Steel Engineering Aktiebolag. Recovering non-volatile metals from dust containing metal oxides. 4,310,350, Cl. 75-10.00R.
Sanyo Electric Co., Ltd.: *See*—
Morita, Toru; Takahasi, Yasumasa; Akamathu, Kohei; and Inothume, Takasi, 4,310,819, Cl. 335-212.000.
Sapino, Chester: *See*—
Walker, Derek; Silvestri, Herbert H.; Sapino, Chester; and Johnson, David A., 4,310,458, Cl. 260-239.100.
Sarcia, Domenico S., to Oerlikon-Buhrle U.S.A. Inc. Cryogenic apparatus. 4,310,337, Cl. 62-6.000.
Sarka, Albert J. Method for attaching die plates to cylinder segments. 4,309,804, Cl. 29-407.000.
Sarkar, Arnab, to Corning Glass Works. Method and apparatus for making optical fiber waveguides. 4,310,340, Cl. 65-3.120.
Sarusawa, Yukio: *See*—
JPX; Takahashi, Keiichi; Aoyama, Hiroshi; Hirakawa, Kikuya; and Sarusawa, Yukio, 4,309,952, Cl. 413-12.000.
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Sato, Kiyoshi: *See*—
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Sato, Yoshimi, to Nissan Motor Co., Ltd. Three points passive seat belt assembly. 4,310,178, Cl. 280-802.000.
Satoh, Hiroaki; Kokubu, Yoshikazu; Kitagawa, Kiyoshi; and Okazaki, Isao, to Kureha Kagaku Kogyo Kabushiki Kaisha. Electrolytic bath vessel elements. 4,310,404, Cl. 204-252.000.
Satoh, Ryozo, to Tel-Thermco Engineering Co., Ltd. Apparatus for thermal treatment of semiconductors. 4,309,961, Cl. 118-733.000.
Saucy, Gabriel: *See*—
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Sauer, Harald: *See*—
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Sawano, Kiyohito; Kobayashi, Toyohiko; and Tsuruta, Haruki, to Takasago Perfumery Co., Ltd. Process for preparing brassylic diester. 4,310,685, Cl. 560-204.000.
Sberze, Piero: *See*—
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Scaletta, Joseph A.: *See*—
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Schaefer, Louis F.: *See*—
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Schaefer, William H.: *See*—
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Schaible, Clifford W., to Bell Telephone Laboratories, Incorporated. Mobile radiotelephone station two-way ranging system. 4,310,722, Cl. 179-2.0EB.
Schalt, Wilfried: *See*—
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Schardt, Michael M., to General Motors Corporation. Composite master cylinder pistons. 4,309,937, Cl. 92-240.000.
Scharer, Hans R.; D'Amato, Dominic A.; Hold, Peter; and Hubner, Manfred, to Intercole Automation, Inc. Continuous mixer internal pressure control. 4,310,251, Cl. 366-77.000.
Scharpf, Kurt: *See*—
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Schedele, Helmut: *See*—
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Schenck, Hans-Uew: *See*—
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Schenck, Hans-Uwe: *See*—
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Schenker, M. Allan. Access shield for uncovered refrigerated units. 4,310,044, Cl. 160-329.000.
Schering AG: *See*—
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Scheve, Heinrich: *See*—
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Schindel, Hugo, to Rationator-Maschinenbau GmbH. Apparatus for inserting a closure with a feedpipe into a container. 4,309,820, Cl. 29-785.000.
Schindel, Hugo. Collet head at a sealing machine. 4,309,859, Cl. 53-331.500.
Schindler, Rudolf: *See*—
Brunsch, Klaus; Schindler, Rudolf; Bongers, Bernd; and Schulz, Ralf-Thilo, 4,309,865, Cl. 57-15.000.
Schlager, Kenneth J. Thermographic method of physical examination of patients. 4,310,003, Cl. 128-736.000.
Schleppnik, Alfred A., to Bush Boake Allen Inc. Derivatives of acetic and propionic acids, compositions containing same and use as malodor counteractants. 4,310,512, Cl. 424-76.000.
Schlesinger GmbH & Co. Maschinenbau KG: *See*—
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Schlinsog, Hans-Juergen: *See*—
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Schlumberger Technology Corporation: *See*—
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Schmalbach-Lubeca GmbH: *See*—
Supik, Helmuth; and Schlinsog, Hans-Juergen, 4,309,951, Cl. 413-18.000.
Schmall, Robert A.: *See*—
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Schmidt, Dietrich F., to Capitol Products Corporation. Thermally insulated hinged windows and doors. 4,309,845, Cl. 49-501.000.
Schmidt, Fred L.: *See*—
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Schmidt, Hans W.: *See*—
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Schmidt, Volkmar; Lieder, Bernhard; Scheve, Heinrich; and Dohren, Hans, to Ruhrchemie Aktiengesellschaft. Process and plant for the gasification of solid fuels via partial oxidation. 4,310,333, Cl. 48-77.000.
Schminke, Wolfgang: *See*—
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Schmitt, Frederick L.: *See*—
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Schmitt, Jakob; and Voit, Willy, to Robert Bosch GmbH. Method of manufacturing a housing for a small electrical machine. 4,309,815, Cl. 29-596.000.
Schmitz, Arthur A., to Akzona Incorporated. N-(2-Hydroxybenzyl)alkylamines as water-repellant agents. 4,310,592, Cl. 428-288.000.
Schneider, Heinz-Walter: *See*—
Kummer, Rudolf; Schneider, Heinz-Walter; Taglieber, Volker; and Weiss, Franz-Josef, 4,310,686, Cl. 560-204.000.
Schneider, Jochen: *See*—
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Scholz, Harald: *See*—
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Schoofs, Franciscus A. C. M., to U.S. Philips Corporation. Arrangement for applying signals to a telephone line. 4,310,733, Cl. 179-170.0NC.

Schopp, Anthony L.; and Macol, George N., Jr. Step ladder utility box. 4,310,134, Cl. 248-210.000.

Schreiber, Anselm, to Bergwerksverband GmbH. Foam breaker for gas/liquid reactors. 4,310,437, Cl. 252-361.000.

Schropp, Wilhelm K., to BASF Aktiengesellschaft. Method of stabilizing monomeric acrylic acid esters against premature polymerization and esters thus stabilized. 4,310,676, Cl. 560-4.000.

Schroter, Herbert: *See*—
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Schrougham, Benton; and Lee, John W. Coupling device for animal collars. 4,309,797, Cl. 24-307.000.

Schubert, William L.: *See*—
Link, Erwin F.; and Schubert, William L., 4,310,062, Cl. 180-139.000.

Schuchardt, Kurt: *See*—
Legutke, Gunter; Rechmeier, Gerhard H.; Scholz, Harald; Schuchardt, Kurt; Holler, Ernst; and Liesenfelder, Gunther, 4,310,713, Cl. 570-243.000.

Schuetzeberg, Jerome H.; and Schuetzeberg, Roy L. Ski and ski pole carrying apparatus. 4,310,190, Cl. 294-147.000.

Schuetzeberg, Roy L.: *See*—
Schuetzeberg, Jerome H.; and Schuetzeberg, Roy L., 4,310,190, Cl. 294-147.000.

Schuhmacher, Gunter; Fahrbach, Erich; and Wagner, Sepp, to Carl Freudenberg, Firma. Method for heat-sealing textile materials with polyurethane adhesives. 4,310,373, Cl. 156-308.200.

Schulz, Ralf-Thilo: *See*—
Brunsch, Klaus; Schindler, Rudolf; Bongers, Bernd; and Schulz, Ralf-Thilo, 4,309,865, Cl. 57-15.000.

Schulze-Berge, Klaus: *See*—
Kohl, Lambert; Boehm, Udo; and Schulze-Berge, Klaus, 4,310,865, Cl. 360-106.000.

Schumacher, Ernest W.; and Evans, Stephen E., to Virginia Chemicals Inc. Replaceable float oil separator. 4,310,338, Cl. 62-470.000.

Schupp, Eberhard: *See*—
Kempter, Fritz E.; Schupp, Eberhard; Schenck, Hans-Uwe; and Gulbins, Erich, 4,310,645, Cl. 525-526.000.
Kempter, Fritz E.; and Schupp, Eberhard, 4,310,646, Cl. 525-528.000.

Schwarz, Alfred V. Magnetic control strip recording device for roadway control system. 4,310,862, Cl. 360-68.000.

Schwenker, Robert O.: *See*—
Horng, Cheng T.; Schwenker, Robert O.; and Tsang, Paul J., 4,309,812, Cl. 29-578.000.

Schwerdt, Kurt R., to Raytheon Company. Interactive display system with touch data entry. 4,310,839, Cl. 340-712.000.

Schwing, Gerhard; and Pindras, Udo, to Friedrich Wilh. Schwing GmbH. Mixer for viscous materials, for example for filter cake, pulp or the like. 4,310,124, Cl. 241-46.110.

Schwoboda, George F.; and Wingrove, Robert C., to Medical Devices, Inc. Serial release mechanism and drainage monitor embodying the same. 4,309,913, Cl. 74-3.520.

Sciarini, Michael J.: *See*—
Keener, Harold M.; and Sciarini, Michael J., 4,310,770, Cl. 307-35.000.

SCM Corporation: *See*—
Bonsack, James P., 4,310,495, Cl. 423-76.000.

Scott, Michael A., to Columbia Ribbon & Carbon Mfg. Co., Inc. Ink ribbon lubrication by liquid silicone oil. 4,310,258, Cl. 400-241.100.

Scribner, Albert W. Control arrangement for dual slide pneumatic feeders. 4,310,114, Cl. 226-162.000.

Sealed Air Corporation: *See*—
Vandenbossche, Benjamin E., 4,310,182, Cl. 285-40.000.

Seals, Harold. Apparatus for mounting valve bags to filling spouts of filling machines. 4,310,037, Cl. 141-166.000.

Seeger, Arnold; Schalt, Wilfried; and Rabiger, Jurgen, to Kernforschungsanlage Julich GmbH. Phase-control device for synchronous motors. 4,310,787, Cl. 318-85.000.

Sefton, Philip C., to Arnold, Donald Arthur. Security equipment including trigger circuit. 4,310,835, Cl. 340-533.000.

Segui, Jacques: *See*—
Guilloteau, Rene; and Segui, Jacques, 4,310,034, Cl. 141-98.000.

Seki, Yukuharu, to Mitsubishi Jukogyo Kabushiki Kaisha. Lower corrugating roll in a single facer. 4,310,375, Cl. 156-462.000.

Sekine, Shigeo, to Max Factor & Company. Combined bottle and screw cap assembly. 4,310,101, Cl. 215-330.000.

Seliga, Gerald W.: *See*—
Budraitis, Tadas; and Seliga, Gerald W., 4,309,907, Cl. 73-771.000.

Seliger, Robert L., to Hughes Aircraft Company. Ion beam lithography process and apparatus using step-and-repeat exposure. 4,310,743, Cl. 219-121.0EB.

Sellschopp, Michael: *See*—
Rucker, Norbert; Sellschopp, Michael; and Fuchs, Hans-Ullrich, 4,310,823, Cl. 338-2.000.

SEP Gesellschaft fur technische Studien Entwicklung Planung mbH: *See*—
Huss, Rainer; and Peters, Werner, 4,310,395, Cl. 204-112.000.

Serban, Alexander; Farquharson, Graeme; Lydiate, Jack; and Bird, Graham J., to ICI Australia Limited. Herbicidal 1,2,4-benzotriazines. 4,310,347, Cl. 71-93.000.

Sereno, John: *See*—
Grethe, Guenter; Uskokovic, Milan R.; and Sereno, John, 4,310,462, Cl. 260-343.500.

Serres, Carl, Jr., to Standard Oil Company (Indiana). Polymeric monohydroxybenzenoid hydroquinoid antioxidants. 4,310,657, Cl. 528-212.000.

SGS ATES, Componenti Elettronici S.p.A.: *See*—
Daniele, Vincenzo; Corda, Giuseppe; Ravaglia, Andrea; and Ferla, Giuseppe, 4,310,571, Cl. 427-102.000.

Shah, Navnit H.: *See*—
Gallo-Torres, Hugo E.; and Shah, Navnit H., 4,310,543, Cl. 424-305.000.

Shainfeld, Oded. Pouch key holder. 4,310,040, Cl. 150-40.000.

Shakrachki, Kiril T.: *See*—
D'Angiolillo; Karmakov, Encho Y.; Shakrachki, Kiril T.; Shakrachki, Metodi T.; Stoyanov, Stoyan H.; Vassileva, Todorka N.; and Trifonov, Todor P., 4,310,254, Cl. 400-109.000.

Shakrachki, Metodi T.: *See*—
D'Angiolillo; Karmakov, Encho Y.; Shakrachki, Kiril T.; Shakrachki, Metodi T.; Stoyanov, Stoyan H.; Vassileva, Todorka N.; and Trifonov, Todor P., 4,310,254, Cl. 400-109.000.

Shannon, Richard F., to Owens-Corning Fiberglas Corporation. Fibrous product formed of layers of compressed fibers. 4,310,585, Cl. 428-218.000.

Shapovalov, Petr F.: *See*—
Maizenberg, Mikhail I.; Kaplan, Mikhail D.; Veremeenko, Stanislav V.; Bobrov, Vladimir T.; Moshkovich, Vladimir U.; Shapovalov, Petr F.; Troitsky, Vladimiru A.; Zhukovsky, Petr G.; and Komsky, Igor B., 4,309,905, Cl. 73-601.000.

Sharp, David A.; and Salisbury, David J., to Raytheon Company. Buoy flotation system. 4,309,786, Cl. 9-8.00R.

Sharp Kabushiki Kaisha: *See*—
Juso, Hiromi; Tsuji, Shigeki; and Maeda, Shigemi, 4,310,838, Cl. 340-701.000.
Kuwagaki, Hiroshi; Kato, Hiroaki; Takechi, Sadatoshi; Nakauchi, Hiroshi; and Inami, Yasuhiko, 4,310,220, Cl. 350-357.000.
Takamatsu, Toshiaki; Minezaki, Shigehiro; Matsuura, Masataka; and Uede, Hisashi, 4,309,814, Cl. 29-592.00R.

Shattuck, Charles W.: *See*—
Condon, Charles E., Jr.; Johnston, Dean E.; and Shattuck, Charles W., 4,310,205, Cl. 308-135.000.

Shaw, Anthony R.; Krueger, Wallace F.; and Bastian, Lloyd E., to Libbey-Owens-Ford Company. Method for producing solar collector panels. 4,310,116, Cl. 228-183.000.

Shay, George C., to Corning Glass Works. Battery cell construction. 4,310,607, Cl. 429-104.000.

Sheasby, Peter G.; Cheetham, Graham; Stuckart, Rainer W. M.; and Gupta, Tarun K. S., to Alcan Research and Development Limited. Aluminium articles having anodic oxide coatings and methods of coloring them by means of optical interference effects. 4,310,586, Cl. 428-220.000.

Sheldrake, Leonard J.; Olson, Stanley E.; and Karau, Philip A., to General Motors Corporation. Charge/float motor vehicle electrical system. 4,310,793, Cl. 322-28.000.

Shell Oil Company: *See*—
Dante, Mark F., 4,310,695, Cl. 564-445.000.

Shen, Tsung-Ying: *See*—
Baldeschwieler, John D.; Gamble, Ronald C.; Mauk, Marcia R.; Shen, Tsung-Ying; and Ponpipom, Mitree M., 4,310,505, Cl. 424-1.000.

Sheng, Ping, to RCA Corporation. Optimal polarization for the optical readout of high density video recording. 4,310,910, Cl. 369-116.000.

Shepherd, Robert G., to American Cyanamid Company. Hypolipidemic and antiatherosclerotic 4-(polyfluoroalkylamino) phenyl compounds. 4,310,545, Cl. 424-310.000.

Sherman, Kenneth N.; and Jacobson, Arnold. Self administrable antifertility composition. 4,310,510, Cl. 424-45.000.

Shetty, Ramakrishna: *See*—
Cooper, Scott A.; Shetty, Ramakrishna; and Pinsky, Jules, 4,310,584, Cl. 428-212.000.

Shibasaki, Ichiro: *See*—
Ohmura, Kaoru; Shibasaki, Ichiro; Kimura, Takeo; and Kimura, Muneaki, 4,310,641, Cl. 525-419.000.

Shields, John. Electro-optical analyzer for measuring percentage by weight of fat, protein and lactose in milk. 4,310,763, Cl. 250-339.000.

Shimano Industrial Company Limited: *See*—
Katayama, Hitoshi, 4,310,260, Cl. 403-7.000.

Shimazaki, Masami: *See*—
Hasegawa, Junzo; Ogura, Masahiro; Hamaguchi, Shigeki; Shimazaki, Masami; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,310,635, Cl. 435-146.000.

Shimogawa, Toshiaki: *See*—
Morita, Masayuki; Kawaharazaki, Takashi; and Shimogawa, Toshiaki, 4,310,128, Cl. 242-107.000.

Shimokawa, Yasuo: *See*—
Nitto, Hajime; Sakai, Kango; Shimokawa, Yasuo; and Saito, Katusi, 4,310,403, Cl. 204-206.000.

Shimose, Masahiro: *See*—
Kubota, Michio; Tsuda, Takeshi; Shimose, Masahiro; Takagi, Kazuhiro; Imamura, Yasuo; and Kato, Kazunori, 4,309,886, Cl. 72-202.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Imada, Kiyoshi; Ueno, Susumu; Nishina, Yasuhide; and Nomura, Hirokazu, 4,310,564, Cl. 427-40.000.
Shinsei Kogyo Company, Ltd.: *See—*
Asano, Kiyoji, 4,309,841, Cl. 46-209.000.
Shiota, Masashi: *See—*
Uegai, Yoshiaki; Watanabe, Tsuyoshi; Shiota, Masashi; Okumoto, Itsuo; and Kayama, Naohiro, 4,310,533, Cl. 424-267.000.
Shipley, Randall S.; and Lowery, Kirby, Jr., to Dow Chemical Company, The. Polymerization of olefins in the presence of a catalyst containing titanium and zirconium. 4,310,648, Cl. 526-114.000.
Shipp, Anthony D. Combing and applicator device. 4,310,009, Cl. 132-88.500.
Shirahata, Kunikatsu: *See—*
Iida, Takao; Shirahata, Kunikatsu; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,310,661, Cl. 536-17.00R.
Shireman, Cyril G.: *See—*
Gretz, Bonita M.; Lewis, J. Stephen; and Shireman, Cyril G., 4,309,879, Cl. 63-29.00R.
Shirota, Shinichi: *See—*
Ohkuma, Takeo; Furumura, Kyozaburo; Tanaka, Akihiko; and Shirota, Shinichi, 4,309,916, Cl. 74-467.000.
Shore, Daniel B., to International Harvester Company. Drive system, controlling braking system therefor, and safety lock controlling both. 4,310,078, Cl. 192-3.00S.
Shreve, John R.; and Vincent, Wesley A., to General Motors Corporation. Voltage responsive switch with input voltage surge protection. 4,310,867, Cl. 361-90.000.
SI Handling Systems, Inc.: *See—*
Haring, Richard, 4,310,073, Cl. 188-62.000.
Siber, George R. Diagnostic test and reagent therefor. 4,310,508, Cl. 424-12.000.
Sick, Erwin; and Ostertag, Klaus, to Erwin Sick GmbH. Apparatus for monitoring for faults in translucent strip material. 4,310,250, Cl. 356-431.000.
Sick, Erwin; and Fetzer, Gunter, to Erwin Sick GmbH Optik-Elektronik. Light grid arrangement using cyclically switched semiconductor light sources. 4,310,756, Cl. 250-221.000.
Siderurgie Maritime (Maritieme Staalnijverheid) SIDMAR S.A.: *See—*
Martens, Theophile, 4,310,386, Cl. 201-39.000.
Siebeneck, Jurgen; and Feddern, Uwe, to U.S. Philips Corporation. Pulsed Doppler radar system. 4,310,842, Cl. 343-5.0PD.
Siegert, Louis D.: *See—*
Binasik, Chester S.; and Siegert, Louis D., 4,310,299, Cl. 432-14.000.
Siemens Aktiengesellschaft: *See—*
Essler, Richard; and Schedele, Helmut, 4,310,818, Cl. 335-135.000.
Finkenzeller, Joahnn; and Holzermer, Gunter, 4,310,766, Cl. 250-509.000.
Heynisch, Hinrich, 4,310,775, Cl. 313-346.00R.
Sillion, Bernard: *See—*
Rabilloud, Guy; and Sillion, Bernard, 4,310,699, Cl. 568-315.000.
Silvernail, Howard N.: *See—*
Mitrzyk, Jan C., Sr.; Gossoo, Rodney W.; Fischer, Charles P.; Silvernail, Howard N.; and Null, Charles, 4,309,928, Cl. 83-161.000.
Silvestri, Herbert H.: *See—*
Walker, Derek; Silvestri, Herbert H.; Sapino, Chester; and Johnson, David A., 4,310,458, Cl. 260-239.100.
Simmonds Precision Products, Inc.: *See—*
Maier, Lawrence C., 4,310,794, Cl. 324-61.00R.
Simonsen, Knud. Method and apparatus for de-hairing hogs. 4,309,795, Cl. 17-47.000.
Singh, Baldev: *See—*
Lesher, George Y.; and Singh, Baldev, 4,310,531, Cl. 424-263.000.
Singh, Balwant: *See—*
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, 4,310,672, Cl. 548-155.000.
Sinoda, Masaki: *See—*
Ichikawa, Shigeo; Nomichi, Satoru; and Sinoda, Masaki, 4,309,890, Cl. 72-368.000.
Siwecki, Thomas L.: *See—*
Frohbach, Hugh F.; Macovski, Albert; Peppers, Norman A.; Siwecki, Thomas L.; and Schaefer, Louis F., 4,310,847, Cl. 358-54.000.
Sjolin, Karen, to KemaNord AB. Process for production of vinyl chloride polymer using alcohols. 4,310,649, Cl. 526-212.000.
SKF Steel Engineering Aktiebolag: *See—*
Santen, Sven, 4,310,350, Cl. 75-10.00R.
Slaten, Gary G., to Discovision Associates. Optical video disc structure. 4,310,919, Cl. 369-275.000.
Sloan Valve Company: *See—*
Lissau, Frederic, 4,309,781, Cl. 4-304.000.
Small, Edward A., Jr.; and Lewin, Ian. Lighting fixture and method using multiple reflections. 4,310,876, Cl. 362-298.000.
Smeltz, Kenneth C., to Du Pont de Nemours, E. I., and Company. Durable, antistatic, soil release agent. 4,310,426, Cl. 252-8.800.
Smillie, John G., to Aurora Industries, Inc. Process for forming shell sand with molten phenolformaldehyde resin. 4,310,045, Cl. 164-527.000.
Smith, Avery B.; and Hayes, Mark J., to Resource Control, Incorporated. Apparatus for removing metal ions and other pollutants from aqueous solutions and moist gaseous streams. 4,310,406, Cl. 204-275.000.
Smith, Craig G.: *See—*
Okinaka, Yutaka; and Smith, Craig G., 4,310,391, Cl. 204-46.00G.
Smith, Kendall O. Micro-analysis process and device. 4,309,912, Cl. 73-864.720.
Snamprogetti, S.p.A.: *See—*
Ciuti, Brunello, 4,310,428, Cl. 252-33.000.
Snow Brand Milk Products Co., Ltd: *See—*
Mita, Kou; Rokuta, Satoru; Takada, Kiyoshi; and Suzuki, Fuziko, 4,310,559, Cl. 426-101.000.
Snyder, Clair W., Jr.: *See—*
Fetterolf, James R., Sr.; Metzger, Donald L.; Snyder, Clair W., Jr.; and Wise, James H., 4,310,213, Cl. 339-103.00M.
Sobieski, John C.: *See—*
Zukowski, Edward C.; and Sobieski, John C., 4,310,773, Cl. 313-221.000.
Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Rosa, Nicola, 4,310,921, Cl. 370-13.000.
Societe d'Etudes et de Recherches en Sources d'Energie Nouvelles (SERSEN): *See—*
Demaire, Georges; Lys, Jacques; and Berger, Michel, 4,310,396, Cl. 204-151.000.
Societe Nationale Elf Aquitaine: *See—*
Chaudot, Gerard; Ombret, Rene; and Zimmerman, Paul, 4,310,296, Cl. 431-5.000.
Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See—*
Engdahl, Jean, 4,310,363, Cl. 148-31.500.
Jaccard, Pierre-Ernest, 4,310,219, Cl. 350-321.000.
Soeno, Ko: *See—*
Fukushima, Hiroshi; Soeno, Ko; Ando, Hisashi; Yamamoto, Shigehiko; and Aida, Toshiyuki, 4,310,777, Cl. 313-345.000.
Soga, George, to Soga Packaging Machinery Co., Ltd. Machine for closing a receptacle. 4,309,860, Cl. 53-76.000.
Soga Packaging Machinery Co., Ltd.: *See—*
Soga, George, 4,309,860, Cl. 53-76.000.
Solid State Systems, Inc.: *See—*
Mehaffey, Joseph H., 4,310,725, Cl. 179-18.0AH.
Solvay & Cie.: *See—*
Vanlautem, Noel; and Gilain, Jacques, 4,310,684, Cl. 560-185.000.
Sony Corporation: *See—*
Hirata, Isao, 4,310,918, Cl. 369-215.000.
Kikuchi, Masahiro; Okada, Hitoshi; Ihashi, Takao; and Kaji, Takeo, 4,310,912, Cl. 369-43.000.
Miyasaka, Tomoaki; and Amano, Toshio, 4,310,924, Cl. 455-181.000.
Nomura, Shigenori; and Kano, Tetsuzo, 4,310,317, Cl. 434-319.000.
Sorsche, Joachim H.; Ableitner, Erich; Gobien, Ernst; and Minning, Manfred, to Daimler-Benz Aktiengesellschaft. Internal combustion engine with aggregate units arranged in an automotive vehicle. 4,309,970, Cl. 123-198.00D.
Sotolongo, Thomas J.: *See—*
Bunnell, Edward D.; and Sotolongo, Thomas J., 4,310,211, Cl. 339-91.00R.
Souriau & Cie: *See—*
de Mendez, Ossona; and Crosnier, Jean J., 4,310,217, Cl. 350-96.160.
Southard, Edward S. Variation of engine coolant heater. 4,309,967, Cl. 123-179.00H.
Spaans, Johannes: *See—*
Eveleens, Willem; Spaans, Johannes; and Wissink, Hendrik G., 4,310,689, Cl. 562-472.000.
Special Metals Corporation: *See—*
Fountain, Richard W.; Boesch, William J.; and Reichman, Steven H., 4,310,354, Cl. 75-211.000.
Sperry Corporation: *See—*
Currie, Thomas P., 4,310,811, Cl. 333-1.000.
De Busscher, Cyriel R. J.; and Van Herpe, Francois, 4,310,004, Cl. 130-27.00F.
De Busscher, Cyriel R. J.; De Coene, Frans J. G. C.; and Van Herpe, Francois, 4,310,005, Cl. 130-27.00P.
Vansteelant, Marc G., 4,310,186, Cl. 289-14.000.
Spiecker, Karl-Heinz: *See—*
Appel, Manfred; Moslener, Jorn; and Spiecker, Karl-Heinz, 4,310,031, Cl. 140-2.000.
Spiteri, Joseph. Grounded dual voltage trouble light and extension cord. 4,310,874, Cl. 362-251.000.
Spoor, Herbert: *See—*
Lehner, August; Hartmann, Heinrich; Bachmann, Rudolf; Kohl, Albert; Spoor, Herbert; Mahler, Karl; and Balz, Werner, 4,310,565, Cl. 427-48.000.
Sprague Electric Company: *See—*
McGrath, N. Christian, 4,310,566, Cl. 427-80.000.
Springer, Jerry L.; and Wells, Charles M., to Ford Motor Company. Exhaust gas sensor seal and protection tube arrangement. 4,309,897, Cl. 73-23.000.
Springmann, Hermann; and Borchers, Karl, to Chemische Werke Huls AG. Process for separating sulfuric acid from sulfoxidation output. 4,310,473, Cl. 260-504.00S.
Spurr, Robert; and Duga, Robert J., to Emhart Industries, Inc. Delay stretch and blow machine system. 4,310,282, Cl. 414-753.000.
Stabilus GmbH: *See—*
Freitag, Herbert, 4,310,148, Cl. 267-124.000.
Stafford, Michael K.: *See—*
Kahan, Hillard M.; Acebo, William F.; and Stafford, Michael K., 4,310,349, Cl. 75-0.50R.
Stahl, Roland, to Robert Bosch GmbH. Electrochemical sensor construction especially automotive-type exhaust gas analyzing sensor. 4,310,401, Cl. 204-195.00S.

Stamires, Dennis: *See—*
Alafandi, Hamid; and Stamires, Dennis, 4,310,441, Cl. 252-453.000.

Standard Oil Company (Indiana): *See—*
Fahrig, Robert J.; and Hinrichs, Lansing M., 4,310,489, Cl. 422-110.000.
Serres, Carl, Jr., 4,310,657, Cl. 528-212.000.

Stanzani, Giuseppe, to Datalogic S.p.A. Photoelectric barrier, particularly useful as an accident-preventing device in machine tools. 4,310,836, Cl. 340-556.000.

Stanziola, Ralph A.: *See—*
Worn, Philip R.; Stanziola, Ralph A.; and Hall, Donald R., 4,310,314, Cl. 434-101.000.

Starr, Mark E. Wood heater. 4,309,976, Cl. 126-61.000.

Stauffer Chemical Company: *See—*
Fancher, Llewellyn W.; and Baker, Don R., 4,310,539, Cl. 424-326.000.

Stavros, Anthony J., to Bethlehem Steel Corporation. Method for wiping hot dip metallic coatings. 4,310,572, Cl. 427-349.000.

Stawsky, Alfred: *See—*
Early, Jack; Kaufman, Arthur; and Stawsky, Alfred, 4,310,605, Cl. 429-18.000.

Stearns, William J.; and Lison, George C., to David Clark Company Incorporated. Sound powered headset. 4,310,732, Cl. 179-156.00A.

Steelhammer, Joe C.; Morrison, Ian D.; and Wittenbrook, Lawrence S., to Betz Laboratories, Inc. Polyethyleneamines as sulfite antioxidants. 4,310,438, Cl. 252-401.000.

Steelman, Ronald S.; and Larkins, Rodney J., to Minnesota Mining and Manufacturing Company. Image transfer element having release layer. 4,310,615, Cl. 430-271.000.

Stefanelli, E. N.: *See—*
Kowalski, Melvin; and Stefanelli, E. N., 4,309,849, Cl. 51-237.00R.

Steffes, Helmut: *See—*
Volkmar, Werner; and Steffes, Helmut, 4,309,934, Cl. 91-373.000.

Steigerwald, Wolf-Erhard, to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co. Rotary variable resistor. 4,310,824, Cl. 338-174.000.

Steinhage, Peter-Wilhelm; and Heinz, Roland, to Heimann GmbH. Controllable hydrogen source with gettering effect for electronic tubes. 4,310,781, Cl. 313-180.000.

Stephenson, Robert L.: *See—*
Rogers, Lloyd W., Jr.; and Stephenson, Robert L., 4,310,177, Cl. 280-802.000.

Sterling Drug Inc.: *See—*
Gelotte, Karl O.; and Parady, Edward D., 4,310,670, Cl. 546-257.000.
Lesher, George Y.; and Singh, Baldev, 4,310,531, Cl. 424-263.000.

Stevens, Aaron A.: *See—*
Elmy, Raymond L.; Crabtree, Joe; Stevens, Aaron A.; and Lawrence, Randall K., 4,310,082, Cl. 192-11.000.

Stewart, Richard C.: *See—*
Stewart, Robert C.; and Stewart, Richard C., 4,310,015, Cl. 137-364.000.

Stewart, Robert C.; and Stewart, Richard C. Curb box with snap-on base. 4,310,015, Cl. 137-364.000.

Stewart-Warner Corporation: *See—*
Baker, John D., 4,310,801, Cl. 328-48.000.

Stiefel, Frank J., to Carter-Wallace, Inc. Oxazolidine propionic acid methyl esters. 4,310,674, Cl. 548-215.000.

Stiles, William V.: *See—*
Roberts, F. Alexander; Stiles, William V.; Cosbey, Robert C.; and Duncan, John P., 4,310,884, Cl. 364-578.000.

Stiros, Paul, to Procter & Gamble Company, The. Superfatted liquid soap skin cleansing compositions. 4,310,433, Cl. 252-132.000.

Stolpin, Roger M. Kit for assembling geodesic structure. 4,309,852, Cl. 52-81.000.

Stolting, Klaus: *See—*
Hilbig, Josef; Holst, Arno; Kunkler, Hans; Stolting, Klaus; and Schminke, Wolfgang, 4,310,663, Cl. 536-91.000.

Stork, Gilbert: *See—*
Wilson, Richard A.; Mookherjee, Braja D.; Hall, John B.; and Stork, Gilbert, 4,310,701, Cl. 568-347.000.

Stormon, Harry J.: *See—*
Gurries, Raymond A.; and Stormon, Harry J., 4,310,054, Cl. 172-40.000.

Stover, Kenneth W., to Bunn-O-Matic Corporation. Beverage brewing apparatus. 4,309,939, Cl. 99-280.000.

Stoyanov, Stoyan H.: *See—*
D'Angiolillo; Karmakov, Encho Y.; Shakrachki, Kiril T.; Shakrachki, Metodi T.; Stoyanov, Stoyan H.; Vassileva, Todorka N.; and Trifonov, Todor P., 4,310,254, Cl. 400-109.000.

Strege, Paul E., to Dow Chemical Company, The. Imidazole catalysts for hydroxyalkylation of phenols or thiophenols. 4,310,706, Cl. 568-648.000.

Strege, Paul E., to Dow Chemical Company, The. Sodium stannate catalyst for hydroxyalkylation of phenols or thiophenols. 4,310,707, Cl. 568-648.000.

Strege, Paul E.; and Doorakian, George A., to Dow Chemical Company, The. Phosphonium catalysts for hydroxyalkylation of phenols or thiophenols. 4,310,708, Cl. 568-648.000.

Streich, Steven G., to Halliburton Services. Inflatable packer element. 4,310,161, Cl. 277-34.000.

Streich, Steven G., to Halliburton Company. Pile wiper seal. 4,310,265, Cl. 405-227.000.

Stricklin, John D.: *See—*
Patel, Dilip C.; Stricklin, John D.; and Koehne, Bruno, 4,310,864, Cl. 360-97.000.

Strom, Terje: *See—*
Raa, Jan; Strom, Terje; Tidemann, Even; and Eide, Ola, 4,309,794, Cl. 17-46.000.

Stuckart, Rainer W. M.: *See—*
Sheasby, Peter G.; Cheetham, Graham; Stuckart, Rainer W. M.; and Gupta, Tarun K. S., 4,310,586, Cl. 428-220.000.

Stumpe, Nelson A., Jr., to Phillips Petroleum Company. Blends of trans-polybutadiene and medium vinyl polybutadiene. 4,310,582, Cl. 428-182.000.

Suau, Jean A., to Schlumberger Technology Corporation. Verification and calibration of well logs and reconstruction of logs. 4,310,887, Cl. 364-422.000.

Suda, Seiji: *See—*
Furuhashi, Toshio; Tokuda, Hiroastu; Suda, Seiji; and Imai, Masumi, 4,310,888, Cl. 364-431.100.

Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See—*
Martin, Hans; and Scharpf, Kurt, 4,310,165, Cl. 277-205.000.
Nonnenmann, Manfred, 4,310,084, Cl. 192-58.00B.

Sudo, Tsuneta: *See—*
Ichimiya, Yoshichika; Sudo, Tsuneta; Maruyama, Hiromi; Sugamori, Shigeru; Sumida, Susumu; and Tokuno, Takashi, 4,310,802, Cl. 328-110.000.

Sugamori, Shigeru: *See—*
Ichimiya, Yoshichika; Sudo, Tsuneta; Maruyama, Hiromi; Sugamori, Shigeru; Sumida, Susumu; and Tokuno, Takashi, 4,310,802, Cl. 328-110.000.

Sugano, Kazuhiko: *See—*
Iwanaga, Kazuyoshi; Sugano, Kazuhiko; and Ohtsuka, Kunio, 4,309,919, Cl. 74-869.000.

Sugawara, Michiaki: *See—*
Konishi, Hideki; Sugawara, Michiaki; and Saito, Muneo, 4,310,420, Cl. 210-659.000.

Suggs, James L.; Buck, Dan F.; and Hobbs, Howard K., to Eastman Kodak Company. Food emulsifiers. 4,310,556, Cl. 426-96.000.

Suggs, James L.; Buck, Dan F.; and Hobbs, Howard K., to Eastman Kodak Company. Food emulsifiers. 4,310,557, Cl. 426-96.000.

Sugimoto, Yukihiro: *See—*
Hara, Yoshio; Takahashi, Tomoyuki; and Sugimoto, Yukihiro, 4,310,091, Cl. 206-455.000.

Sulzer Brothers Ltd.: *See—*
Riesen, Peter, 4,309,880, Cl. 66-207.000.

Sumi, Akiyasu: *See—*
Konishi, Yuichiro; Kitagishi, Nozomu; and Sumi, Akiyasu, 4,310,231, Cl. 354-79.000.

Sumida, Susumu: *See—*
Ichimiya, Yoshichika; Sudo, Tsuneta; Maruyama, Hiromi; Sugamori, Shigeru; Sumida, Susumu; and Tokuno, Takashi, 4,310,802, Cl. 328-110.000.

Sumitomo Chemical Company, Limited: *See—*
Funaki, Masaaki; Yoshida, Motoaki; Inatomi, Haruo; Kuriyama, Ryozo; and Oshima, Taizo, 4,310,330, Cl. 8-506.000.
Maeda, Isamu; and Aoshima, Masashi, 4,310,443, Cl. 260-5.000.

Sun Electric Corporation: *See—*
Kreft, Keith A.; Rossetti, Alan E.; and Lynn, Michael F., 4,309,900, Cl. 73-117.200.

Sunbeam Plastics Corporation: *See—*
Gach, Peter P., 4,310,105, Cl. 222-153.000.

Sundeen, Arthur R.; and Elliott, Harold V., to General Motors Corporation. Steering column electrical connector arrangement. 4,310,174, Cl. 280-731.000.

Sundstrand Corporation: *See—*
Loy, Jeffrey A.; Goetsch, Albert H.; and Lahman, John W., 4,310,187, Cl. 292-56.000.

Superior Products, Inc.: *See—*
Gaus, Frank D.; and Klabunde, Edwin C., 4,310,446, Cl. 260-28.5AS.

Supik, Helmuth; and Schlinsog, Hans-Juergen, to Schmalbach-Lubeca GmbH. Method for deburring sheet metal parts, such as can covers. 4,309,951, Cl. 413-18.000.

Supra Aktiebolag: *See—*
Kvant, Magnus B., 4,310,360, Cl. 106-306.000.

Sutherland, Robert J.: *See—*
Hutchison, James M. S.; Sutherland, Robert J.; Edelstein, William A.; and Mallard, John R., 4,310,799, Cl. 324-319.000.

Sutphin, Howard D.: *See—*
Lieber, Albert J.; and Sutphin, Howard D., 4,310,857, Cl. 358-217.000.

Suzuki, Fred K.: *See—*
Davison, Thomas W.; and Suzuki, Fred K., 4,310,577, Cl. 428-1.000.

Suzuki, Fuziko: *See—*
Mita, Kou; Rokuta, Satoru; Takada, Kiyoshi; and Suzuki, Fuziko, 4,310,559, Cl. 426-101.000.

Suzuki, Kenji: *See—*
Katsura, Tadahiko; Suzuki, Kenji; and Ito, Senji, 4,310,578, Cl. 428-35.000.

Suzuki, Noboru: *See—*
Kunimoto, Go; Ichinose, Isao; Suzuki, Noboru; and Mori, Fumio, 4,310,100, Cl. 215-228.000.

Svala, Carl G. Party line apparatus. 4,310,723, Cl. 179-17.00A.

Svendsen, Walter W.: *See—*
Beckley, Gary H.; Svendsen, Walter W.; and Anderson, Ronald B., 4,309,922, Cl. 81-57.160.

Svoboda, Melora J. Apparatus for cleaning closed-end tubes. 4,310,010, Cl. 134-135.000.

Swahn, Nils H.: *See—*
Trehn, Karl B.; and Swahn, Nils H., 4,310,890, Cl. 364-467.000.
Swift, Graham: *See—*
Jenkins, Raymond F.; and Swift, Graham, 4,310,453, Cl. 260-42.540.
Swift, Joseph A., to Xerox Corporation. Wick for dispensing fuser oil. 4,309,957, Cl. 118-60.000.
Swihart, Terence J.: *See—*
Blizzard, John D.; and Swihart, Terence J., 4,310,678, Cl. 556-451.000.
Sycam Advanced Technology Corp.: *See—*
Camilleri, Thomas M., 4,310,149, Cl. 267-136.000.
Synres Chemical Corporation: *See—*
Trubiano, Paolo C.; and Cohen, Aaron Y., 4,310,356, Cl. 106-25.000.
Syntex (U.S.A.) Inc.: *See—*
Edwards, John A., 4,310,466, Cl. 260-397.100.
Szalvay, Laszlo, to Raychem Corporation. Composite pipe coupling. 4,310,183, Cl. 285-114.000.
Szuch, A. William. Self adjusting device for mooring boats. 4,309,954, Cl. 114-230.000.
Tabata, Osamu; and Waseda, Mitoshi, to Agency of Industrial Science & Technology; and Chugoku Marine Paints, Ltd. Method for chemical vapor deposition. 4,310,567, Cl. 427-82.000.
Tachita, Ryobun; Hayakawa, Yoshihiro; Fukukita, Hiroshi; Yano, Tsutomu; Irioka, Kazuyoshi; and Fukumoto, Akira, to Matsushita Electric Industrial Company, Limited. Scan converter for a sector scan type ultrasound imaging system. 4,310,907, Cl. 367-11.000.
Tackett, James E., Jr., to Marathon Oil Company. Method for maximizing the pumpability efficiency of a hydrocarbon slurry by controlling the wax crystal content. 4,310,011, Cl. 137-13.000.
Taglieber, Volker: *See—*
Kummer, Rudolf; Schneider, Heinz-Walter; Taglieber, Volker; and Weiss, Franz-Josef, 4,310,686, Cl. 560-204.000.
Taiho Kogyo Co., Ltd.: *See—*
Ichikawa, Shigeo; Nomichi, Satoru; and Sinoda, Masaki, 4,309,890, Cl. 72-368.000.
Takada, Kiyoshi: *See—*
Mita, Kou; Rokuta, Satoru; Takada, Kiyoshi; and Suzuki, Fuziko, 4,310,559, Cl. 426-101.000.
Takagi, Fumio: *See—*
Arai, Eisuke; Takagi, Fumio; Ishii, Yasuaki; and Kamei, Kuniaki, 4,310,370, Cl. 156-220.000.
Takagi, Kazuhiro: *See—*
Kubota, Michio; Tsuda, Takeshi; Shimose, Masahiro; Takagi, Kazuhiro; Imamura, Yasuo; and Kato, Kazunori, 4,309,886, Cl. 72-202.000.
Takahashi, Keiichi: *See—*
JPX; Takahashi, Keiichi; Aoyama, Hiroshi; Hirakawa, Kikuya; and Sarusawa, Yukio, 4,309,952, Cl. 413-12.000.
Takahashi, Masaru; and Sato, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Plug-in type connector. 4,310,210, Cl. 339-64.00M.
Takahashi, Shuichi; and Kondo, Mitsuru, to Ricoh Company, Ltd. Paper cutter for facsimile apparatus. 4,310,859, Cl. 358-304.000.
Takahashi, Tomoyuki: *See—*
Hara, Yoshio; Takahashi, Tomoyuki; and Sugimoto, Yukihiro, 4,310,091, Cl. 206-455.000.
Takahasi, Yasumasa: *See—*
Morita, Toru; Takahasi, Yasumasa; Akamathu, Kohei; and Inothume, Takasi, 4,310,819, Cl. 335-212.000.
Takamatsu, Toshiaki; Minezaki, Shigehiro; Matsuura, Masataka; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Manufacture of a multilayered liquid crystal display panel. 4,309,814, Cl. 29-592.00R.
Takamatu, Kazuo: *See—*
Yamazaki, Yasuyuki; Emi, Shingo; Norota, Susumu; Takamatu, Kazuo; and Ono, Tomoyoshi, 4,310,594, Cl. 428-296.000.
Takami, Akio; and Kondo, Kazuo, to NGK Spark Plug Co., Ltd. Coated glass powder having a negative coefficient of linear thermal expansion and a composition containing the same. 4,310,598, Cl. 428-406.000.
Takasago Medical Industry Co., Ltd.: *See—*
Inoue, Noboru, 4,310,115, Cl. 227-19.000.
Takasago Perfumery Co., Ltd.: *See—*
Sawano, Kiyohito; Kobayashi, Toyohiko; and Tsuruta, Haruki, 4,310,685, Cl. 560-204.000.
Takata, Masanobu: *See—*
Sakurai, Soichi; Fukuda, Kyohei; and Takata, Masanobu, 4,310,780, Cl. 313-412.000.
Takato, Masao: *See—*
Imai, Masumi; Takato, Masao; and Tokuda, Hiroastu, 4,310,889, Cl. 364-431.040.
Takatsuki, Toyohiko, to Zojirushi Vacuum Bottle Co., Ltd. Vacuum bottle with bellows pump. 4,310,104, Cl. 222-131.000.
Takechi, Sadatoshi: *See—*
Kuwagaki, Hiroshi; Kato, Hiroaki; Takechi, Sadatoshi; Nakauchi, Hiroshi; and Inami, Yasuhiko, 4,310,220, Cl. 350-357.000.
Takeda Riken Kogyo Kabushiki Kaisha: *See—*
Ichimiya, Yoshichika; Sudo, Tsuneta; Maruyama, Hiromi; Sugamori, Shigeru; Sumida, Susumu; and Tokuno, Takashi, 4,310,802, Cl. 328-110.000.
Niki, Shoji, 4,310,891, Cl. 364-484.000.
Takenaka, Sadao: *See—*
Kurihara, Hiroshi; and Takenaka, Sadao, 4,310,803, Cl. 328-167.000.
Takeuchi, Isao: *See—*
Ozawa, Isao; Ito, Tomiyoshi; Hamada, Yoshiki; and Takeuchi, Isao, 4,310,682, Cl. 560-142.000.
Takeuchi, Koichi; Okada, Takeo; and Aoki, Shinichi, to Mitsubishi Denki K.K. Vacuum circuit interrupter. 4,310,736, Cl. 200-144.00B.
Takeyama, Hidetoshi; Uezasa, Yukihiro; and Yuasa, Yasuo, to Matsushita Electric Works, Ltd. Method of manufacturing gas-charged electric switches. 4,309,816, Cl. 29-622.000.
Takinishi, Kiyotoshi; and Iwasaki, Shingi, to Rion Co., Ltd. Electropalatograph. 4,310,002, Cl. 128-642.000.
Tamaru, Akio; Kinsho, Yoshio; and Yoshida, Takayuki, to Mitsubishi Chemical Industries Limited. Process for the preparation of cyclohexanone. 4,310,703, Cl. 568-361.000.
Tamir, Yehuday: *See—*
Derfler, Sara; Tamir, Yehuday; and Wagner, Daniel B., 4,310,504, Cl. 424-1.000.
Tamura, Hideyuki, to Nissan Motor Company, Ltd. Electronically controlled ignition device for combustion engine. 4,309,973, Cl. 123-609.000.
Tamura, Poohsan N.: *See—*
Lee, Tzuo-Chang; and Tamura, Poohsan N., 4,310,894, Cl. 364-822.000.
Tamura, Tooru. Vacuum operated valve mechanism. 4,310,141, Cl. 251-28.000.
Tanaka, Akihiko: *See—*
Ohkuma, Takeo; Furumura, Kyozaburo; Tanaka, Akihiko; and Shirota, Shinichi, 4,309,916, Cl. 74-467.000.
Tanaka, Isamu: *See—*
Oka, Hitoshi; Nakamura, Kenji; Yokono, Hitoshi; Isogai, Tokio; Matsuo, Akira; Miyazawa, Osamu; and Tanaka, Isamu, 4,310,563, Cl. 427-8.000.
Tanaka, Minoru: *See—*
Ebina, Ryuzo; Nakayama, Tsutomu; and Tanaka, Minoru, 4,310,376, Cl. 156-499.000.
Tanaka, Yoshinobu; Ogawa, Koichi; and Hioka, Minoru, to Kuraray Company, Limited. Plate type fluid treatment apparatus. 4,310,416, Cl. 210-321.300.
Task, Harry L.: *See—*
Genco, Louis V.; and Task, Harry L., 4,310,242, Cl. 356-128.000.
Tawse, Ian S., to Co-Gen, Inc. Total energy system including means for utilizing supplementary heats. 4,309,877, Cl. 62-238.100.
Taylor, David W.: *See—*
Baker, Benjamin H.; and Taylor, David W., 4,310,800, Cl. 324-78.00D.
Taylor, John B.: *See—*
Terry, John C.; and Taylor, John B., 4,309,821, Cl. 30-32.000.
Taylor, Thomas J.: *See—*
Elliott, William A.; and Taylor, Thomas J., 4,310,365, Cl. 156-55.000.
Teague, J. T., to LaSalle, LeRoy. Method for handling pipe. 4,310,283, Cl. 414-786.000.
Technicare Corporation: *See—*
Madson, Lawrence P., 4,310,853, Cl. 358-140.000.
Tegda, Joseph E.: *See—*
Mazzone, Frank L.; and Tegda, Joseph E., 4,310,769, Cl. 290-54.000.
Teijin Limited: *See—*
Yamazaki, Yasuyuki; Emi, Shingo; Norota, Susumu; Takamatu, Kazuo; and Ono, Tomoyoshi, 4,310,594, Cl. 428-296.000.
Tel-Thermco Engineering Co., Ltd.: *See—*
Satoh, Ryozo, 4,309,961, Cl. 118-733.000.
Teledyne Industries, Inc.: *See—*
Cammack, Michael A.; and Mullins, Keith M., 4,309,783, Cl. 5-508.000.
Kowalski, Melvin; and Stefanelli, E. N., 4,309,849, Cl. 51-237.00R.
Temple, Michael D.; Rancourt, James D.; and Anthon, Erik W. Cathode ray tube face plate construction for suppressing the halo having a low reflection and method. 4,310,783, Cl. 313-474.000.
Tenneco Chemicals, Inc.: *See—*
Jenkins, Raymond F.; and Swift, Graham, 4,310,453, Cl. 260-42.540.
TePastte, Albert, to General Motors Corporation. Electromagnetic fuel injector with adjustable armature spring. 4,310,123, Cl. 239-585.000.
Terada, Masaaki, to Olympus Optical Co., Ltd. Photographing apparatus for an endoscope. 4,310,228, Cl. 354-33.000.
Teramachi, Hiroshi. Linear ball bearing unit and method for manufacturing same. 4,310,202, Cl. 308-6.00C.
Terry, Bernard W. H.: *See—*
Costain, Winston; Terry, Bernard W. H.; Punja, Nazim; and Cleare, Peter J. V., 4,310,464, Cl. 260-343.600.
Terry, John C.; and Taylor, John B., to Gillette Company, The. Razor. 4,309,821, Cl. 30-32.000.
Terumo Corporation: *See—*
Ichikawa, Toshizi; Watanabe, Teruko; and Asada, Yoshimitus, 4,310,430, Cl. 252-60.000.
Tesch, William; and Lavallee, Michael H., to Universal Foods Corporation. Particle injection system for a fluid bed dryer. 4,309,829, Cl. 34-10.000.
Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,310,542, Cl. 424-304.000.
Testerman, Charles B.: *See—*
Rich, Roger K.; and Testerman, Charles B., 4,310,272, Cl. 411-185.000.

Tetsudo Kizai Kogyo Company Limited: *See*—
Matsuo, Yoshio; and Matsubara, Kentaro, 4,310,120, Cl. 238-349.000.

Texaco Development Corp.: *See*—
McEntire, Edward E.; and Zimmerman, Robert L., 4,310,634, Cl. 521-115.000.

Texaco, Inc.: *See*—
Dorawala, Tansukhlal G.; Reinhard, Russell R.; and Kerr, Edwin R., 4,310,715, Cl. 585-487.000.
McCall, Richard H., 4,309,911, Cl. 73-862.530.
Pogonowski, Ivo C., 4,309,891, Cl. 72-399.000.

Texas Instruments Incorporated: *See*—
Henderson, Alva E.; and Frantz, Gene A., 4,310,831, Cl. 340-347.00M.

Textron Inc.: *See*—
Kirrish, Hail, 4,310,273, Cl. 411-338.000.
Rich, Roger K.; and Testerman, Charles B., 4,310,272, Cl. 411-185.000.

Theeuwes, Felix, to Alza Corporation. System with microporous releasing diffusor. 4,309,996, Cl. 128-260.000.

Thekdi, Arvind C.; Buchwald, Robert W.; and Schmall, Robert A., to Midland-Ross Corporation. Batch coil annealing furnace baseplate. 4,310,302, Cl. 432-205.000.

Therapeople, Inc.: *See*—
Frank, Daniel G.; Schaefer, Jack; and Zweig, Richard L., 4,310,315, Cl. 434-114.000.

Thermacore, Inc.: *See*—
Eastman, George Y.; Ernst, Donald M.; and Thomas, Warren E., 4,309,986, Cl. 126-433.000.

Thermal Energy Storage, Inc.: *See*—
McCormack, Richard A.; and Jensen, Eric A., 4,309,980, Cl. 126-263.000.

Theurer, Josef; and Riessberger, Klaus, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile machine for removing surface irregularities from rail heads. 4,309,846, Cl. 51-5.00B.

Thomann, Patricia L. Diet control apparatus. 4,310,316, Cl. 434-127.000.

Thomas, Warren E.: *See*—
Eastman, George Y.; Ernst, Donald M.; and Thomas, Warren E., 4,309,986, Cl. 126-433.000.

Thome, Ludwig: *See*—
Wanner, Karl; Thome, Ludwig; Faelchle, Joerg; and Lehmann, Werner, 4,310,055, Cl. 173-118.000.

Thome, Roland: *See*—
Reh, Lothar; Schmidt, Hans W.; Sauer, Harald; Winkhaus, Gunter; Thome, Roland; and Moritz, Dieter, 4,310,501, Cl. 423-484.000.

Thompson, Malcolm J.: *See*—
Hunt, LaWanda M.; Thompson, Malcolm J.; and Robbins, William E., 4,310,547, Cl. 424-325.000.

Thomson-CSF: *See*—
Hareng, Michel; Le Berre, Serge; and Leclerc, Pierre, 4,310,858, Cl. 358-302.000.
Roche, Marcel; and Litot, Jean P., 4,310,362, Cl. 148-1.500.

Thomson, Donald C., to United States of America, Navy. Optimized diesel engine exhaust silencer. 4,310,067, Cl. 181-228.000.

Thorn EMI Limited: *See*—
Owen, Peter; and Rees, John M., 4,310,782, Cl. 313-271.000.

Tibbals, Charles E. In-line feed system. 4,310,088, Cl. 198-425.000.

Tibolla, Marcellino: *See*—
Doria, Gianfederico; Romeo, Ciriaco; Sberze, Piero; Tibolla, Marcellino; and Corno, Maria L., 4,310,526, Cl. 424-248.550.
Doria, Gianfederico; Romeo, Ciriaco; Corno, Maria L.; Sberze, Piero; and Tibolla, Marcellino, 4,310,589, Cl. 424-263.000.

Tideman, Ann M.: *See*—
Burkhardt, Alan E.; and Tideman, Ann M., 4,310,626, Cl. 435-28.000.

Tidemann, Even: *See*—
Raa, Jan; Strom, Terje; Tidemann, Even; and Eide, Ola, 4,309,794, Cl. 17-46.000.

Timms, Rayford W.: *See*—
Hensiek, Charles R.; Mutchler, Paul A.; and Timms, Rayford W., 4,309,978, Cl. 126-110.00B.

TK Valve & Manufacturing, Inc.: *See*—
Plow, Arthur E., 4,310,071, Cl. 184-88.00R.

Tkalenko, Victor J., Jr.: *See*—
Mowry, William H., Jr.; McElligott, Michael J.; Tkalenko, Victor J., Jr.; and Baran, Joseph, 4,310,180, Cl. 283-8.00B.

Tobe, Akihiro: *See*—
Kikumoto, Ryoji; Tobe, Akihiro; Fukami, Harukazu; Egawa, Mitsuo; and Ninomiya, Kunihiro, 4,310,534, Cl. 424-267.000.

Toei, Ryozo: *See*—
Sada, Eizo; Katoh, Shigeo; Toei, Ryozo; and Michiki, Hideyuki, 4,310,253, Cl. 366-273.000.

Toho Pharmaceutical Co., Ltd.: *See*—
Aonuma, Shinichiro, 4,310,521, Cl. 424-232.000.

Tokan Kogyo Co., Ltd.: *See*—
JPX; Takahashi, Keiichi; Aoyama, Hiroshi; Hirakawa, Kikuya; and Sarusawa, Yukio, 4,309,952, Cl. 413-12.000.

Toki, Tadaaki: *See*—
Nishiyama, Ryuzo; Haga, Takahiro; Toki, Tadaaki; Koyanagi, Tohru; and Murai, Shigeo, 4,310,530, Cl. 424-263.000.

Tokuda, Hiroastu: *See*—
Furuhashi, Toshio; Tokuda, Hiroastu; Suda, Seiji; and Imai, Masumi, 4,310,888, Cl. 364-431.100.
Imai, Masumi; Takato, Masao; and Tokuda, Hiroastu, 4,310,889, Cl. 364-431.040.

Tokuno, Takashi: *See*—
Ichimiya, Yoshichika; Sudo, Tsuneta; Maruyama, Hiromi; Sugamori, Shigeru; Sumida, Susumu; and Tokuno, Takashi, 4,310,802, Cl. 328-110.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Nakanishi, Masae; Nakamura, Kiyoshi; and Kawasaki, Syozo, 4,310,492, Cl. 422-246.000.

Toldy, Lajos: *See*—
Hajos, Andor; Fekete, Marton; Kurti, Marianna; Lang, Tibor; Toldy, Lajos; Borvendeg, Janos; Nagy, Laszlo; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,310,549, Cl. 424-330.000.

Tom McGuane Industries, Inc.: *See*—
Ludwig, George C., 4,310,142, Cl. 251-30.000.

Tominaga, Shinji: *See*—
Yamashita, Maki; and Tominaga, Shinji, 4,310,734, Cl. 200-11.00R.

Tomlinson, Harry M.: *See*—
United States of America, National Aeronautics and Space Administration; Robinson, Robert K.; and Tomlinson, Harry M., 4,310,132, Cl. 244-119.000.

Tonomura, Yoshinobu: *See*—
Hanyu, Susumu; and Tonomura, Yoshinobu, 4,310,788, Cl. 318-551.000.

Toray Silicone Company, Ltd.: *See*—
Hamada, Mitsuo; and Yasuda, Sadami, 4,310,444, Cl. 260-18.00S.

Torbett, Christopher J.: *See*—
Rice, Warren A.; Vinton, Clarence S.; Franklin, Charles H.; and Torbett, Christopher J., 4,310,747, Cl. 219-381.000.

Torbett, Michael A.: *See*—
Cantrell, John H., Jr.; Heyman, Joseph S.; Yost, William T.; Torbett, Michael A.; and Breazeale, Mack A., 4,310,906, Cl. 367-181.000.

Torck, Bernard; Convers, Alain; Asselineau, Lionel; and Hellin, Michel, to Institut Francais du Petrole. Process for manufacturing and recovering methyl tert.butyl ether. 4,310,710, Cl. 568-697.000.

Torres, Carlos A., to McMurry/Hughes, Inc. Equipment holder. 4,309,899, Cl. 73-86.000.

Torrington Company, The: *See*—
Condon, Charles E., Jr.; Johnston, Dean E.; and Shattuck, Charles W., 4,310,205, Cl. 308-135.000.

Toyo Engineering Corporation: *See*—
Sada, Eizo; Katoh, Shigeo; Toei, Ryozo; and Michiki, Hideyuki, 4,310,253, Cl. 366-273.000.

Toyo Ink Manufacturing Co., Ltd.: *See*—
Ehashi, Shigeyuki; Tsuchida, Junichi; Kakimoto, Kenichi; and Katsura, Hiromitsu, 4,310,359, Cl. 106-288.00Q.

Toyo Rubber Industry Co., Ltd., The: *See*—
Inoue, Teruo, 4,310,043, Cl. 152-356.00R.

Toyo Seikan Kaisha Limited: *See*—
Katsura, Tadahiko; Suzuki, Kenji; and Ito, Senji, 4,310,578, Cl. 428-35.000.
Kunimoto, Go; Ichinose, Isao; Suzuki, Noboru; and Mori, Fumio, 4,310,100, Cl. 215-228.000.

Toyomura, Yasuhiro; Fujisaki, Hitoshi; and Onodera, Hideo, to Hitachi Denshi K.K. Modulator systems. 4,310,810, Cl. 332-31.00T.

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Etschenberg, Eugen; Opitz, Wolfgang; and Raddatz, Siegfried, 4,310,517, Cl. 424-177.000.

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Miller, William P.; and Twigg, Robert W., 4,310,369, Cl. 156-218.000.

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Takamatsu, Toshiaki; Minezaki, Shigehiro; Matsuura, Masataka; and Uede, Hisashi, 4,309,814, Cl. 29-592.00R.

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Dexter, James T., 4,310,110, Cl. 224-246.000.

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Pavlin, Mark S., 4,310,714, Cl. 585-275.000.

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Administrator, National Aeronautics and Space Administration: *See—*
Cantrell, John H., Jr.; Heyman, Joseph S.; Yost, William T.; Torbett, Michael A.; and Breazeale, Mack A., 4,310,906, Cl. 367-181.000.

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Hunt, LaWanda M.; Thompson, Malcolm J.; and Robbins, William E., 4,310,547, Cl. 424-325.000.

Air Force: *See—*
Basinski, Edward M., Jr., 4,310,121, Cl. 239-265.330.
Genco, Louis V.; and Task, Harry L., 4,310,242, Cl. 356-128.000.
Kelley, Lawrence R., 4,310,215, Cl. 350-1.500.
Rolinski, Edmund J.; and Laub, Bernard, 4,309,901, Cl. 73-147.000.

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Zee-Cheng, Robert K.; and Cheng, Chia-Chung, 4,310,666, Cl. 544-380.000.

Army: *See—*
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Donovan, William F., 4,310,162, Cl. 277-103.000.
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Gardner, Leland V., 4,310,760, Cl. 250-338.000.
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Thomson, Donald C., 4,310,067, Cl. 181-228.000.
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Baker, Ian M.; and Withers, Richard B., 4,310,583, Cl. 428-209.000.
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Dil, Jan G., 4,310,916, Cl. 369-109.000.
Duys, Andreas M. W., 4,310,776, Cl. 313-414.000.
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Perkins, Charles V.; and Firth, John R., 4,310,244, Cl. 356-334.000.
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van der Linden, Peter M. C.; and van Wieringen, Cornelis, 4,310,815, Cl. 333-138.000.

United Technologies Corporation: *See—*
Arrigoni, John P., 4,309,848, Cl. 51-135.00R.
Carlson, Russell L.; and Schaefer, William H., 4,310,292, Cl. 425-8.000.
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Tesch, William; and Lavallee, Michael H., 4,309,829, Cl. 34-10.000.

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Dean, Weibley J.; Holmes, Robert H.; and Ragard, Phillip A., 4,309,808, Cl. 29-566.300.

University of California, The Regents of the: *See—*
Ono, Kanji, 4,309,903, Cl. 73-587.000.

University of Maine, Board of Trustees of the: *See—*
Hill, Richard C., 4,309,965, Cl. 122-15.000.

University of Missouri, The Curators of the: *See—*
Fahim, Mostafa S., 4,309,989, Cl. 128-24.00A.

University of Toledo, The: *See—*
Roll, William D., 4,310,532, Cl. 424-267.000.

University of Utah: *See—*
Harris, Joel M.; and Dovichi, Norman J., 4,310,762, Cl. 250-343.000.

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McLaurin, Colin A., 4,310,167, Cl. 280-5.280.

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Birkenmeyer, Robert D., 4,310,660, Cl. 536-11.000.
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Valek, John: *See—*
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Vallance, James K.; and Cook, Jeffrey A., to Ford Motor Company. Centrifugal advanced system for wave compression supercharger. 4,309,972, Cl. 123-559.000.

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King, David A.; and Vallans, Sidney J., 4,309,844, Cl. 47-56.000.

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Checkland, John A.; and Valois, Paul, 4,310,597, Cl. 428-383.000.

VanArsdall, Mary L.: *See—*
Field, Thomas R.; and VanArsdall, Mary L., 4,310,257, Cl. 400-208.000.

Van Buskirk, Oral R., to Du Pont de Nemours, E. I., and Company. Solar selective surfaces. 4,310,596, Cl. 428-336.000.

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Vangermain, Erwin; Mengler, Claus-Dieter; Elm, Rainer; Ueberschaer, Horst; and Brauckmann, Wilhelm, to Chemische Werke Huls AG. Supported silver catalysts mixed with promoter metal compounds for the production of ethylene oxide. 4,310,442, Cl. 252-455.00R.

Van Herpe, Francois: *See—*
De Busscher, Cyriel R. J.; and Van Herpe, Francois, 4,310,004, Cl. 130-27.00F.
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Van Scotter, Keith T.: *See—*
Meredith, Michael D.; Edwards, Louis L., Jr.; and Van Scotter, Keith T., 4,310,384, Cl. 162-60.000.

Vansteelant, Marc G., to Sperry Corporation. Knotter apparatus. 4,310,186, Cl. 289-14.000.

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Varady, Theodore F. Hydraulic-actuating device for motor vehicles. 4,310,173, Cl. 280-704.000.

Varian Associates, Inc.: *See—*
Falce, Louis R., 4,310,603, Cl. 428-596.000.

Varnau, Michael J.; and Gouge, William, to General Motors Corporation. Panel mounting device and assembly. 4,309,856, Cl. 52-506.000.

Vassileva, Todorka N.: *See—*
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Veber, Daniel F.: *See—*
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Venaleck, John T.: *See—*
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Vendramini, Dante. Telescopic mast. 4,309,854, Cl. 52-121.000.

Venema, Harry J., to Borg-Warner Corporation. Control apparatus for controlling surge in air compressor-driven system. 4,309,871, Cl. 60-39.28R.

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Verdegaal, William J.; and Verdegaal, George F., 4,310,343, Cl. 71-28.000.

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Reh, Lothar; Schmidt, Hans W.; Sauer, Harald; Winkhaus, Gunter; Thome, Roland; and Moritz, Dieter, 4,310,501, Cl. 423-484.000.

Veremeenko, Stanislav V.: *See—*
Maizenberg, Mikhail I.; Kaplan, Mikhail D.; Veremeenko, Stanislav V.; Bobrov, Vladimir T.; Moshkovich, Vladimir U.; Shapovalov, Petr F.; Troitsky, Vladimiru A.; Zhukovsky, Petr G.; and Komsky, Igor B., 4,309,905, Cl. 73-601.000.

Verkinderen, Paul A.: *See—*
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Vernaleken, Hugo: *See—*
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Vibra Screw, Incorporated: *See—*
Greck, Eugene; Wahl, Eugene A.; and Wahl, Richard C., 4,310,106, Cl. 222-161.000.

Vickers Limited: *See—*
Gawler, David A., 4,310,087, Cl. 192-142.00R.

Vig, Zoltan: *See—*
Budai, Zoltan; Jurak, Ferenc; Kis-tamas, Attila; Lay nee Konya, Aranka; Mezei, Tibor; Vig, Zoltan; and Zubovits nee Kristof, Terez, 4,310,348, Cl. 71-121.000.

Vikre, Merle A. Irrigation system and volume control valve therefor. 4,310,122, Cl. 239-502.000.

Vinals, Joaquin F.: *See—*
Klemarczyk, Philip T.; Sanders, James M.; Vock, Manfred H.; Vinals, Joaquin F.; Schmitt, Frederick L.; and Granda, Edward J., 4,310,681, Cl. 560-120.000.

Vincent, Wesley A.: *See—*
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Vinton, Clarence S.: *See—*
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Virginia Chemicals Inc.: *See—*
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Visual Systems Corp.: *See—*
Martin, Gregory K.; and Brunner, Alexander, 4,310,751, Cl. 235-92.0MP.

Vits, Hilmar, to Vits Maschinenbau GmbH. Apparatus for threading a float web dryer. 4,309.830, Cl. 34-120.000.

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Vock, Manfred H.: *See—*
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Vogel, Ignaz. Vehicle passenger seat. 4,310,196, Cl. 297-417.000.

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Schmitt, Jakob; and Voit, Willy, 4,309,815, Cl. 29-596.000.

Volkamer, Klaus; Broellos, Klaus; Lindner, Alfred; Wagner, Ulrich; Weitz, Hans-Martin; and Schneider, Klaus-Juergen, to BASF Aktiengesellschaft. Isolation of a conjugated diolefin from a C_4- or C_5 hydrocarbon. 4,310,388, Cl. 203-51.000.

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Voplex Corporation: *See—*
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Voyer, Peter E.: *See—*
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Vurpillat, Victor V.: *See—*
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Vydec, Inc.: *See—*
Williams, Jonathan R.; and Heidt, Thomas D., 4,310,840, Cl. 340-724.000.

W. B. Combustion, Inc.: *See—*
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W. C. Heraeus GmbH: *See—*
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Wacker Corporation: *See—*
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Wade, Peter C.: *See—*
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Wagner, Daniel B.: *See—*
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Wagner, John W.: *See—*
Yates, Samuel L.; Cole, Charles J.; Wiesner, Albert H.; and Wagner, John W., 4,310,659, Cl. 528-323.000.

Wagner, Kuno: *See—*
Findeisen, Kurt; Freimuth, Reinhard; and Wagner, Kuno, 4,310,692, Cl. 564-61.000.

Wagner, Ross I., to Rockwell International Corporation. Singlet delta oxygen generator and process. 4,310,502, Cl. 423-579.000.

Wagner, Sepp: *See—*
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Wagner, Ulrich: *See—*
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Wahl, Eugene A.: *See—*
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Wakabayashi, Hiroshi: *See—*
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Waldron, Robert D., to Hammitt, Dale D. Methods of producing fuels from solid materials. 4,310,334, Cl. 48-197.00R.

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Walker, Derek; Silvestri, Herbert H.; Sapino, Chester; and Johnson, David A., to Bristol-Myers Company. Production of penicillins. 4,310,458, Cl. 260-239.100.

Walker, Derek: *See—*
Cundall, Robert L.; and Walker, Derek, 4,310,459, Cl. 260-239.100.

Walker, Frank A., Jr. String tension tester. 4,309,910, Cl. 73-862.460.

Wallick, Hyman: *See—*
Albers-Schonberg, George; Wallick, Hyman; Ormond, Robert E.; Miller, Thomas W.; and Burg, Richard W., 4,310,519, Cl. 424-181.000.

Wallshein, Melvin. Multi-purpose orthodontic bracket. 4,310,306, Cl. 433-14.000.

Walter, John, to Continental Group, Inc., The. Closure for pressure container. 4,310,102, Cl. 220-288.000.

Waltz, Lothar: *See—*
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Wang, Alan E.; and Bassett, David R., to Union Carbide Corporation. Crosslinkable autodeposition coating compositions containing a glycoluril derivative. 4,310,450, Cl. 260-29.60N.

Wang, Ching C.; and Dick, Nancy J., to Merck & Co., Inc. Method of treating giardiasis and trichomoniasis. 4,310,541, Cl. 424-304.000.

Wang, David N.: *See—*
Flamm, Daniel L.; Maydan, Dan; and Wang, David N., 4,310,380, Cl. 156-643.000.

Wanheim, Tarras: *See—*
Nielsen, Ove; Nielsen, Leif; and Wanheim, Tarras, 4,309,885, Cl. 72-197.000.

Wanner, Karl; Thome, Ludwig; Faelchle, Joerg; and Lehmann, Werner, to Robert Bosch GmbH. Percussion hammer with a one piece striker. 4,310,055, Cl. 173-118.000.
Warabi, Junichi: *See*—
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Waseda, Mitoshi: *See*—
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Watanabe, Katsujiro: *See*—
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Watanabe, Kiyoshi: *See*—
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Watanabe, Teruko: *See*—
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Watanabe, Tetsuo: *See*—
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Watanabe, Toshiyuki; and Morigaki, Masakazu, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,310,623, Cl. 430-505.000.
Watanabe, Toshiyuki: *See*—
Ichijima, Seiji; Yabuki, Yoshiharu; Watanabe, Toshiyuki; and Furutachi, Nobuo, 4,310,619, Cl. 430-387.000.
Watanabe, Tsuyoshi: *See*—
Uegai, Yoshiaki; Watanabe, Tsuyoshi; Shiota, Masashi; Okumoto, Itsuo; and Kayama, Naohiro, 4,310,533, Cl. 424-267.000.
Wattron, Albert, to Belrecolt. Harvesting machine with improved skirts. 4,309,863, Cl. 56-320.100.
Watts, George T., to Goodyear Tire & Rubber Company, The. Tire with sidewall protector. 4,310,041, Cl. 152-187.000.
Wayner, Robert J.: *See*—
Gullo, James M.; Heilman, William P.; Wayner, Robert J.; and Moser, Robert E., 4,310,551, Cl. 424-249.000.
Webb, Michael G., to British Petroleum Company Limited, The. Anti-pollution equipment. 4,310,415, Cl. 210-242.300.
Weber, Karl-Arnold: *See*—
Pisaric, Karl H.; Weber, Karl-Arnold; Traubel, Harro; Brauner, Dieter; and Pahl, Manfred H., 4,310,493, Cl. 422-135.000.
Weber, Wilhelm; and Adam, Wilhelm, to Cassella Aktiengesellschaft. Curable and cured, modified aminotriazine condensation products and a means and process for their manufacture. 4,310,447, Cl. 260-29.40R.
Webster, John L.; and Venaleck, John T., to Chabin Corporation. Molded electrical connector. 4,310,208, Cl. 339-14.00R.
Wedler, Herbert: *See*—
Hiersig, Heinz M.; and Wedler, Herbert, 4,309,914, Cl. 74-15.400.
Weible, Warren W., to Zeller Corporation, The. Universal joint with lubricating means. 4,310,206, Cl. 308-187.000.
Weilbach, August; Ragsdale, Charles W.; and Perkins, Corles M., to Cavitron Corporation. Precisely movable mirror mount. 4,310,224, Cl. 351-23.000.
Weir, W. David: *See*—
Kilbourn, Edward E.; and Weir, W. David, 4,310,537, Cl. 424-300.000.
Weirich, Walter, to Gewerkschaft Eisenhutte Westfalia. Hydraulic control devices for use with mining apparatus. 4,310,027, Cl. 137-637.200.
Weiss, Franz-Josef: *See*—
Kummer, Rudolf; Schneider, Heinz-Walter; Taglieber, Volker; and Weiss, Franz-Josef, 4,310,686, Cl. 560-204.000.
Weitz, Hans-Martin: *See*—
Volkamer, Klaus; Broellos, Klaus; Lindner, Alfred; Wagner, Ulrich; Weitz, Hans-Martin; and Schneider, Klaus-Juergen, 4,310,388, Cl. 203-51.000.
Wells, Charles M.: *See*—
Springer, Jerry L.; and Wells, Charles M., 4,309,897, Cl. 73-23.000.
Welsh, James W.; and Anderson, Robert A. Load-line fastener. 4,310,181, Cl. 285-4.000.
Welsh, Jay Y., to Chemetals Corporation. Manganese nitrate spray decomposition. 4,310,494, Cl. 423-49.000.
Wempe, Richard J., to ACF Industries, Incorporated. Combination top operable and bottom operable tank lading valve assembly. 4,310,145, Cl. 251-144.000.
Wenzel, Jurgen M.; and Birkheuer, Horst V., to Mannesmann DeMag AG. Mobile delivery flow unifier. 4,310,278, Cl. 414-332.000.
Wernicke, Hans J.; Kreuter, Walter; and Schliebener, Claus, to Linde Aktiengesellschaft. Thermal cracking of heavy fraction of hydrocarbon hydrogenate. 4,310,409, Cl. 208-57.000.
Wesner, Walter H., to AFA Corporation, The. Manually operated, trigger actuated diaphragm pump dispenser. 4,310,107, Cl. 222-214.000.
West Electric Company, Ltd.: *See*—
Iwata, Hiroshi, 4,310,785, Cl. 315-241.00P.
West, Jon K.; LeDuc, Kenneth; and Ferrus, Serge, to General Electric Company. Reuse of waste water in battery manufacture. 4,310,421, Cl. 210-740.000.
Western Electric Company, Inc.: *See*—
Elliott, William A.; and Taylor, Thomas J., 4,310,365, Cl. 156-55.000.
Fleming, Mills L.; Fuchs, George L.; Gladden, Robert H., Jr.; and Ross, Robert R., 4,310,209, Cl. 339-14.00R.
Iyengar, Rama, 4,310,474, Cl. 261-1.000.
Resener, Baird E., 4,310,729, Cl. 179-90.00R.
Westinghouse Electric Corp.: *See*—
Buck, Daniel C.; Hess, Ricky D.; and Niehenke, Edward C., 4,310,809, Cl. 331-117.00D.
Isenberg, Arnold O.; and Bradley, David F., 4,310,402, Cl. 204-195.00S.
Wetterhorn, Richard H.; and Busch, David A., to Dresser Industries, Inc. Clamp for panel mounting of gauge instruments. 4,310,133, Cl. 248-27.100.
Weyerhaeuser Company: *See*—
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Whalley, William G.: *See*—
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White, Beverly A.: *See*—
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White, David L.; and White, Beverly A. Sheet material device with loosely rotatable member. 4,309,839, Cl. 46-36.000.
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White, Ronald P.: *See*—
Ballard, Samuel S.; and White, Ronald P., 4,310,904, Cl. 367-131.000.
White, William F. Spring type lower leg muscle exerciser. 4,310,155, Cl. 272-136.000.
Whiteside, John F., to Maremont Corporation. Shock absorbers with improved compressible cushions. 4,310,077, Cl. 188-282.000.
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Widmer, Colin F. Cooled components for furnaces. 4,310,147, Cl. 266-190.000.
Wiech, Norbert L.; and Ursillo, Richard C., to Richardson-Merrell, Inc. TCA Composition and method for rapid onset antidepressant therapy. 4,310,524, Cl. 424-244.000.
Wiedermann, Rolf: *See*—
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Wiesner, Albert H.: *See*—
Yates, Samuel L.; Cole, Charles J.; Wiesner, Albert H.; and Wagner, John W., 4,310,659, Cl. 528-323.000.
Wildman, John R.: *See*—
Kulesza, Ralph J.; Wildman, John R.; and Meyer, Burton C., 4,310,156, Cl. 273-1.0GE.
Wilkening, Gregory C., to Phillips Petroleum Company. Catalytic cracking. 4,310,411, Cl. 208-153.000.
Willard, Hope L.: *See*—
Carter, James R.; and Willard, Hope L., 4,309,974, Cl. 124-23.00R.
Willette, Betty: *See*—
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Willette, Leo; and Willette, Betty. Card shuffling device. 4,310,160, Cl. 273-149.00R.
Williams, Bolie C., III: *See*—
Church, Richard M., Jr.; and Williams, Bolie C., III, 4,310,139, Cl. 251-1.00B.
Williams, Jonathan R.; and Heidt, Thomas D., to Vydec, Inc. Text-processing. 4,310,840, Cl. 340-724.000.
Wilmeth, Claude H., to N-S-W Corporation. Power tool for torquing enclosed connectors. 4,309,923, Cl. 81-57.340.
Wilson, Andrew G.: *See*—
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Wilson Greatbatch Ltd.: *See*—
Liang, Charles C.; Bolster, M. Elizabeth; and Murphy, Robert M., 4,310,609, Cl. 429-194.000.
Wilson, Richard A.; Mookherjee, Braja D.; Hall, John B.; and Stork, Gilbert, to International Flavors & Fragrances Inc. Process for the preparation of homologues of methyl dihydrojasmonate. 4,310,701, Cl. 568-347.000.
Wilson, Stephen T.; Lok, Brent M.; and Flanigen, Edith M., to Union Carbide Corporation. Crystalline metallophosphate compositions. 4,310,440, Cl. 252-435.000.
Wing, Lawrence W. Blowing game including rolling cylinder and cooperating scoring zone. 4,310,159, Cl. 273-108.000.
Wingrove, Robert C.: *See*—
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Winkhaus, Gunter: *See*—
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Winterbottom, Malcolm L.; and Burtonshaw, Donald W. H., to Transprints (U.K.) Limited. Wet transfer printing. 4,310,327, Cl. 8-467.000.
Wirth, William F., to Borg-Warner Corporation. Shoothrough fault protection system for bipolar transistors in a voltage source transistor inverter. 4,310,866, Cl. 361-88.000.
Wisconsin Alumni Research Foundation: *See*—
Olson, Norman F.; and Magee, Edward L., Jr., 4,310,554, Cl. 426-40.000.
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Wissner, Allan; and Floyd, Middleton B., Jr., to American Cyanamid Company. 1-Hydroxylmethyl-11-deoxy-16-hydroxy-prosten-1-ol-derivatives. 4,310,700, Cl. 568-330.000.
Witco Chemical Corporation: *See*—
Longley, Kermit D.; and Karalis, Anastasios J., 4,310,683, Cl. 560-151.000.
Withers, Richard B.: *See*—
Baker, Ian M.; and Withers, Richard B., 4,310,583, Cl. 428-209.000.
Wittenbrook, Lawrence S.: *See*—
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Woerz, Otto: *See*—
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Wolff, John S., III; Hemsworth, George R.; and Jensen, Keith E., to Pfizer Inc. Lipid amines formulated with fat or lipid emulsions as vaccine adjuvants. 4,310,550, Cl. 424-365.000.
Won, Ihn J. Torsional shear wave generator. 4,310,066, Cl. 181-121.000.
Woods, Walter: *See*—
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Work, Dale E.: *See*—
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World Development Laboratories: *See*—
Frohbach, Hugh F.; Macovski, Albert; Peppers, Norman A.; Siwecki, Thomas L.; and Schaefer, Louis F., 4,310,847, Cl. 358-54.000.
Worn, Philip R.; Stanziola, Ralph A.; and Hall, Donald R., to Applied Color Systems, Inc. Reflected color simulator. 4,310,314, Cl. 434-101.000.
Wright, Stephen C., to Hansaloy Corporation. Blade guide. 4,309,930, Cl. 83-820.000.
Wuerzer, Bruno: *See*—
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Wun, Ten T., to Nalco Chemical Company. Water dispersible band ply lubricant. 4,310,427, Cl. 252-21.000.
Wurmb, Rolf: *See*—
Horacek, Heinrich; Barl, Manfred; Wurmb, Rolf; and Marx, Matthias, 4,310,632, Cl. 521-121.000.
Wyatt, Michael A.; and Beckwith, Robert W., to Beckwith Electric Co., Inc. Method for transferring power in a synchronous mode to a motor bus. 4,310,771, Cl. 307-64.000.
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Peacock, Richard A., 4,310,767, Cl. 250-551.000.
Wyman, Ransome J.; Alshin, Richard A.; and Gilbert, Charles H., to Carefree Bicycle Tire Company. Insert for non-pneumatic tires. 4,310,042, Cl. 152-322.000.
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Blaszak, Joseph R., 4,309,803, Cl. 29-130.000.
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Yamada, Mitsuhiro; Katayama, Hirokazu; Ishii, Toshitsugu; Makino, Yoshihiro; and Kamio, Masashi, to Mitsubishi Denki Kabushiki Kaisha; Yamada, Mitsuhiro; and Katayama, Hirokazu. Automatic analyzer for combustible gas in oil. 4,310,487, Cl. 422-68.000.
Yamada, Shuri: *See*—
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Yamagishi, Ryozo; Mita, Mamoru; Yoshioka, Osamu; and Ishikawa, Tetsuo, to Hitachi, Ltd. Apparatus for applying chemical plating to inner surfaces of tubular members. 4,309,959, Cl. 118-664.000.
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Yamaguchi, Noboru, to Bridgestone Tire Co., Ltd. Shock absorbing device for tugboat. 4,309,956, Cl. 114-249.000.
Yamaguchi, Shin: *See*—
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Yamamoto, Katsuyuki: *See*—
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Yamamoto, Shigehiko: *See*—
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Yamasaki, Tatsuya, to Ryobi Limited. Fishing spinning reel. 4,310,127, Cl. 242-84.10J.
Yamashita, Maki; and Tominaga, Shinji, to Minolta Camera Kabushiki Kaisha. Electric circuit unit. 4,310,734, Cl. 200-11.00R.
Yamazaki, Yasuyuki; Emi, Shingo; Norota, Susumu; Takamatu, Kazuo; and Ono, Tomoyoshi, to Teijin Limited. Composite sheet structure. 4,310,594, Cl. 428-296.000.
Yano, Tsutomu: *See*—
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Yarlovsky, Milka G. Hand-held weaver's reed and method of use. 4,310,030, Cl. 139-29.000.
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Yoder, Max N., to United States of America, Navy. Electron beam controlled array antenna. 4,310,843, Cl. 343-100.0SA.
Yokoe, Masaaki; and Kobayashi, Mituo, to Brother Kogyo Kabushiki Kaisha. Machine tool with an automatic tool changing device. 4,309,809, Cl. 29-568.000.
Yokono, Hitoshi: *See*—
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Bailey, Ronald L., 4,310,310, Cl. 433-126.000.
Young, Henry S. C. Machine for crutching sheep and other associated veterinary purposes. 4,309,964, Cl. 119-103.000.
Young, Stanley G.: *See*—
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Yuasa, Yasuo: *See*—
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Yule, Lance S. Metering valve for beverage containers. 4,310,038, Cl. 141-351.000.
Yuuki, Hironori; Inagaki, Kazunori; Arai, Makoto; Baba, Noboru; Yamada, Matsuichi; and Kurihara, Hiroshi, to Kokusai Denshin Denwa Kabushiki Kaisha. Cross polarization compensating system. 4,310,813, Cl. 333-117.000.
Zacharias, George, to Dow Chemical Company, The. Halogenated dicyclopentadienyl fumarates. 4,310,647, Cl. 525-530.000.
Zafar, Humayon Z.: *See*—
Ruskan, Richard P.; Zafar, Humayon Z.; Goens, Duane N.; Hyatt, David E.; and Kenney, Charlie W., 4,310,490, Cl. 422-188.000.
Zahnradfabrik Friedrichshafen, AG.: *See*—
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Zahorchak, John A.: *See*—
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Zee-Cheng, Robert K.; and Cheng, Chia-Chung, to United States of America, America. Anti-neoplastic 1,4-bis-(substituted aminoalkyl amino)-anthraquinones. 4,310,666, Cl. 544-380.000.
Zeller Corporation, The: *See*—
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Zepp, Charles M.: *See*—
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Zimmerman, Paul: *See*—
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Zinchuk, Michael, to Polaroid Corporation. Diffracted energy auto-ranging system for a camera. 4,310,227, Cl. 354-25.000.
Ziner, Erwin N. Self-deicing windshield wiper. 4,309,789, Cl. 15-250.360.
Zinsmeyer, Thomas M.: *See*—
Leonard, Gary S.; and Zinsmeyer, Thomas M., 4,309,876, Cl. 62-79.000.
Zojirushi Vacuum Bottle Co., Ltd.: *See*—
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Zubovits nee Kristof, Terez: *See*—
Budai, Zoltan; Jurak, Ferenc; Kis-tamas, Attila; Lay nee Konya, Aranka; Mezei, Tibor; Vig, Zoltan; and Zubovits nee Kristof, Terez, 4,310,348, Cl. 71-121.000.
Zukowski, Edward C.; and Sobieski, John C., to General Electric Company. Glass flash tube. 4,310,773, Cl. 313-221.000.
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Frank, Daniel G.; Schaefer, Jack; and Zweig, Richard L., 4,310,315, Cl. 434-114.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF JANUARY, 1982

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Atsumi, Minoru: *See*—
Yagi, Shizuo; and Atsumi, Minoru, Re. 30,844, Cl. 123-198.0DB.

Charreton, Roland: *See*—
Ossona de Mendez, Michel; Dupuy, Michel J.; Charreton, Roland; and Foucard, Albert, Re. 30,845, Cl. 356-440.000.

Dupuy, Michel J.: *See*—
Ossona de Mendez, Michel; Dupuy, Michel J.; Charreton, Roland; and Foucard, Albert, Re. 30,845, Cl. 356-440.000.

Eaton Corporation: *See*—
Gee, Thomas A., Re. 30,847, Cl. 310-168.000.

Foucard, Albert: *See*—
Ossona de Mendez, Michel; Dupuy, Michel J.; Charreton, Roland; and Foucard, Albert, Re. 30,845, Cl. 356-440.000.

Gee, Thomas A., to Eaton Corporation. Tubular wheel speed sensor. Re. 30,847, Cl. 310-168.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Yagi, Shizuo; and Atsumi, Minoru, Re. 30,844, Cl. 123-198.0DB.

Lang, Alexander C.; and Lunde, Peter A., to Santa Fe International Corporation. Submarine pipeline laying vessel. Re. 30,846, Cl. 405-168.000.

Lunde, Peter A.: *See*—
Lang, Alexander C.; and Lunde, Peter A., Re. 30,846, Cl. 405-168.000.

Ossona de Mendez, Michel; Dupuy, Michel J.; Charreton, Roland; and Foucard, Albert, to Roussel-Uclaf. Apparatus for automatically measuring the light transmission factor or liquid test samples. Re. 30,845, Cl. 356-440.000.

Roussel-Uclaf: *See*—
Ossona de Mendez, Michel; Dupuy, Michel J.; Charreton, Roland; and Foucard, Albert, Re. 30,845, Cl. 356-440.000.

Santa Fe International Corporation: *See*—
Lang, Alexander C.; and Lunde, Peter A., Re. 30,846, Cl. 405-168.000.

Yagi, Shizuo; and Atsumi, Minoru, to Honda Giken Kogyo Kabushiki Kaisha. Run-on prevention device for internal combustion engines. Re. 30,844, Cl. 123-198.0DB.

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Agfa-Gevaert AG: *See*—
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Ajia Amerikan Boueki Kabushiki Kaisha: *See*—
Yamazaki, Shogo, 262,632, Cl. D16-1.000.

Alskog, Bjorn, to Plasto KB KY. Toy animal figure. 262,645, 1-12-82, Cl. D21-185.000.

American Cyanamid Company: *See*—
Grodin, Adam J., 262,604, Cl. D9-309.000.
Grodin, Adam J., 262,605, Cl. D9-309.000.

American Standard Inc.: *See*—
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Arlasky, David F. Combined hood and ignition lock. 262,602, 1-12-82, Cl. D8-331.000.

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ISSUED JANUARY 12, 1982

NOTE.—First number, class; second number, subclass; third number, patent number

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CLASS 56

10.5	4,309,862
320.1	4,309,863

CLASS 57

6	4,309,864
15	4,309,865
	4,309,866
58.3	4,309,867
124	4,309,868
293	4,309,869

CLASS 60

39.08	4,309,870
39.28 R	4,309,871
517	4,309,872
646	4,309,873
648	4,309,874

CLASS 62

6	4,310,337
66	4,309,875
79	4,309,876
238.1	4,309,877
470	4,310,338
542	4,309,878

CLASS 63

29 R	4,309,879

CLASS 65

3.12	4,310,339
	4,310,340
	4,310,341
27	4,310,342

CLASS 66

207	4,309,880

CLASS 68

205 R	4,309,881

CLASS 70

186	4,309,882
456 R	4,309,883
472	4,309,884

CLASS 71

28	4,310,343
61	4,310,344
76	4,310,345
92	4,310,346
93	4,310,347
121	4,310,348

CLASS 72

197	4,309,885
202	4,309,886
280	4,309,887
334	4,309,888
356	4,309,889
368	4,309,890
399	4,309,891
402	4,309,892
455	4,309,893
457	4,309,894
	4,309,895

CLASS 73

1 B	4,309,896
23	4,309,897
23.1	4,309,898
86	4,309,899
117.2	4,309,900
147	4,309,901
159	4,309,902
587	4,309,903
597	4,309,904
601	4,309,905
612	4,309,906
720	4,309,908
771	4,309,907
861.12	4,309,909
862.46	4,309,910
862.53	4,309,911
864.72	4,309,912

CLASS 74

3.52	4,309,913
15.4	4,309,914
339	4,309,915
467	4,309,916
861	4,309,917
867	4,309,918
869	4,309,919

CLASS 75

0.5 R	4,310,349
10 R	4,310,350
77	4,310,351
93 R	4,310,352
166 B	4,310,353
211	4,310,354

CLASS 81

3 R	4,309,920
3.46 R	4,309,921
57.16	4,309,922
57.34	4,309,923
159	4,309,924

CLASS 82

12	4,309,925
19	4,309,926

CLASS 83

77	4,309,927
161	4,309,928
554	4,309,929
820	4,309,930
832	4,309,931

CLASS 84

1.03	4,309,932

CLASS 86

1 R	4,310,324
	4,310,325

CLASS 89

9	4,309,933

CLASS 91

373	4,309,934
376 R	4,309,935
405	4,309,936

CLASS 92

240	4,309,937

CLASS 99

280	4,309,939
281	4,309,940
453	4,309,941
477	4,309,938
501	4,309,942
509	4,309,943

CLASS 100

104	4,309,944

CLASS 101

247	4,309,945

CLASS 102

213	4,309,946

CLASS 106

2	4,310,355
25	4,310,356
97	4,310,358
288 Q	4,310,359
306	4,310,360

CLASS 110

203	4,309,947
263	4,309,948
341	4,309,949

CLASS 112

103	4,309,950

CLASS 114

72	4,309,953
230	4,309,954
	4,309,955
249	4,309,956

CLASS 118

60	4,309,957
306	4,309,958
664	4,309,959
665	4,309,960
733	4,309,961

CLASS 119

74	4,309,962
96	4,309,963
103	4,309,964

CLASS 122

15	4,309,965

CLASS 123

90.28	4,309,966
179 H	4,309,967
187.5 R	4,309,968
188 VA	4,309,969
198 D	4,309,970
198 DB	Re.30,844
480	4,309,971
559	4,309,972
609	4,309,973

CLASS 124

23 R	4,309,974
35 A	4,309,975

CLASS 126

61	4,309,976
99 A	4,309,977
110 B	4,309,978
131	4,309,979
263	4,309,980
417	4,309,981
420	4,309,982
422	4,309,983
	4,309,984
	4,309,985
433	4,309,986
448	4,309,987
450	4,309,988

CLASS 127

5	4,310,361

CLASS 128

24 A	4,309,989
90	4,309,990
165	4,309,991
213 A	4,309,992
214 E	4,309,993
214 R	4,309,994
239	4,309,995
260	4,309,996
270	4,309,997
303.1	4,309,998
371	4,309,999
419 P	4,310,001
419 PG	4,310,000
642	4,310,002
736	4,310,003

CLASS 130

27 F	4,310,004
27 P	4,310,005

CLASS 131

290	4,310,006
329	4,310,007

CLASS 132

40	4,310,008
88.5	4,310,009

CLASS 134

135	4,310,010

CLASS 137

13	4,310,011
75	4,310,012
145	4,310,013
227	4,310,014
364	4,310,015
493.8	4,310,016
533	4,310,017
539.5	4,310,018
553	4,310,019
563	4,310,020
624.18	4,310,022
624.2	4,310,021
625.21	4,310,024
625.48	4,310,025
625.5	4,310,023
637	4,310,026
637.2	4,310,027

CLASS 138

39	4,310,028
89	4,310,029

CLASS 139

29	4,310,030

CLASS 140

2	4,310,031
82	4,310,032

CLASS 141

44	4,310,033
97	4,310,035
98	4,310,034
114	4,310,036
166	4,310,037
351	4,310,038

CLASS 144

193 A	4,310,039

CLASS 148

1.5	4,310,362
31.5	4,310,363

CLASS 149

2	4,310,364

CLASS 150

40	4,310,040

CLASS 152

187	4,310,041
322	4,310,042
356 R	4,310,043

CLASS 156

55	4,310,365
69	4,310,366
85	4,310,367
148	4,310,368
218	4,310,369
220	4,310,370
227	4,310,371
245	4,310,372
308.2	4,310,373
394 FM	4,310,374
462	4,310,375
499	4,310,376
	4,310,377
506	4,310,378
541	4,310,379
643	4,310,380
664	4,310,381

CLASS 159

16 R	4,310,382

CLASS 160

329	4,310,044

CLASS 162

37	4,310,383
60	4,310,384

CLASS 164

527	4,310,045

CLASS 165

5	4,310,046
64	4,310,047

CLASS 166

212	4,310,048
267	4,310,049
318	4,310,050
323	4,310,051
362	4,310,052

CLASS 172

20	4,310,053
40	4,310,054

CLASS 173

118	4,310,055
169	4,310,056

CLASS 174

15 WF	4,310,718
94 R	4,310,719

CLASS 175

21	4,310,057
48	4,310,058
320	4,310,059

CLASS 177

70	4,310,060

CLASS 178

22.08	4,310,720

CLASS 179

1 SA	4,310,721
2 EB	4,310,722
17 A	4,310,723
18 AH	4,310,725
18 B	4,310,726
	4,310,727
18 FA	4,310,724
18 HB	4,310,728
90 R	4,310,729
110 A	4,310,730
110 F	4,310,731
156 A	4,310,732
170 NC	4,310,733

CLASS 180

139	4,310,061
	4,310,062
143	4,310,063
271	4,310,064

CLASS 181

121	4,310,066
159	4,310,065
228	4,310,067
290	4,310,068
296	4,310,069

CLASS 182

134	4,310,070

CLASS 184

88 R	4,310,071

CLASS 187

9 R 4,310,072

CLASS 188

62 4,310,073
72.9 4,310,074
73.35 4,310,076
73.45 4,310,075
282 4,310,077

CLASS 192

3 S 4,310,078
4 A 4,310,079
4,310,081
4 B 4,310,080
11 4,310,082
18 R 4,310,083
58 B 4,310,084
4,310,085
111 A 4,310,086
142 R 4,310,087

CLASS 198

425 4,310,088
530 4,310,089

CLASS 200

11 R 4,310,734
144 B 4,310,735
4,310,736

CLASS 201

39 4,310,386

CLASS 202

175 4,310,387

CLASS 203

51 4,310,388

CLASS 204

1 T 4,310,389
37 R 4,310,390
46 G 4,310,391
52 R 4,310,392
59 R 4,310,393
82 4,310,394
112 4,310,395
151 4,310,396
159.22 4,310,397
181 C 4,310,398
195 M 4,310,400
195 R 4,310,399
195 S 4,310,401
4,310,402
206 4,310,403
252 4,310,404
4,310,405
275 4,310,406
299 R 4,310,407
301 4,310,408

CLASS 206

443 4,310,090
455 4,310,091
578 4,310,092
624 4,310,093

CLASS 208

57 4,310,409
120 4,310,410
153 4,310,411

CLASS 209

10 4,310,412
456 4,310,413

CLASS 210

238 4,310,414
242.3 4,310,415
321.3 4,310,416
375 4,310,417
467 4,310,418
493.4 4,310,419
659 4,310,420
740 4,310,421
769 4,310,422
791 4,310,423
4,310,424

CLASS 211

49 D 4,310,097
60 A 4,310,095
60 T 4,310,094
88 4,310,096

CLASS 212

187 4,310,098

CLASS 213

62 A 4,310,099

CLASS 215

228 4,310,100
330 4,310,101

CLASS 219

10.55 A 4,310,738
4,310,739
59.1 4,310,737
61.11 4,310,740
69 M 4,310,742
69 P 4,310,741
121 EB 4,310,743
130.51 4,310,744
213 4,310,745
326 4,310,746
381 4,310,747
437 4,310,748

CLASS 220

288 4,310,102

CLASS 221

15 4,310,103

CLASS 222

131 4,310,104
153 4,310,105
161 4,310,106
214 4,310,107
396 4,310,108

CLASS 224

230 4,310,109
246 4,310,110
252 4,310,111

CLASS 225

3 4,310,112

CLASS 226

4 4,310,113
162 4,310,114

CLASS 227

19 4,310,115

CLASS 228

183 4,310,116

CLASS 229

62.5 4,310,118
73 4,310,117

CLASS 233

1 R 4,310,119

CLASS 235

29 R 4,310,749
70 A 4,310,750
92 MP 4,310,751
92 PL 4,310,752
145 R 4,310,753
454 4,310,754

CLASS 238

349 4,310,120

CLASS 239

265.33 4,310,121
502 4,310,122
585 4,310,123

CLASS 241

46.11 4,310,124
195 4,310,125

CLASS 242

47 4,310,126
84.1 J 4,310,127
107 4,310,128
107.4 B 4,310,129
179 4,310,130
204 4,310,131

CLASS 244

119 4,310,132

CLASS 248

27.1 4,310,133
210 4,310,134
221.4 4,310,135
278 4,310,136
467 4,310,137

CLASS 249

180 4,310,138

CLASS 250

214 R 4,310,755
221 4,310,756
236 4,310,757
255 4,310,758
309 4,310,759
338 4,310,760
339 4,310,763
342 4,310,761
343 4,310,762
440 4,310,764
493 4,310,765
509 4,310,766
551 4,310,767

CLASS 251

1 B 4,310,139
5 4,310,140
28 4,310,141
30 4,310,142
4,310,143
134 4,310,144
144 4,310,145

CLASS 252

8.5 A 4,310,425
8.8 4,310,426
21 4,310,427
33 4,310,428
51.5 A 4,310,429
60 4,310,430
91 4,310,431
108 4,310,432
132 4,310,433
174.21 4,310,434
180 4,310,435
316 4,310,436
361 4,310,437
401 4,310,438
429 B 4,310,439
435 4,310,440
453 4,310,441
455 R 4,310,442

CLASS 254

342 4,310,146

CLASS 260

5 4,310,443
18 S 4,310,444
23.5 A 4,310,445
28.5 AS 4,310,446
29.4 R 4,310,447
29.6 N 4,310,450
29.6 NR 4,310,448
4,310,449
34.2 4,310,451
38 4,310,452
42.54 4,310,453
45.75 S 4,310,454
112 B 4,310,455
112.5 R 4,310,456
235 4,310,457
239.1 4,310,458
4,310,459
4,310,460
326.2 4,310,461
343.5 4,310,462
343.6 4,310,463
4,310,464
396 R 4,310,465
397.1 4,310,466
397.5 4,310,467
412.4 4,310,468
446 4,310,469
453.7 4,310,470
456 P 4,310,471
465.4 4,310,472
504 S 4,310,473

CLASS 261

1 4,310,474
113 4,310,475
118 4,310,476

CLASS 264

22 4,310,478
37 4,310,479
56 4,310,480
62 4,310,477
65 4,310,481
4,310,482
117 4,310,483
176 R 4,310,484
288.4 4,310,485
309 4,310,486

CLASS 266

190 4,310,147

CLASS 267

124 4,310,148
136 4,310,149

CLASS 269

139 4,310,150

CLASS 271

11 4,310,151
186 4,310,152
259 4,310,153

CLASS 272

67 4,310,154
136 4,310,155

CLASS 273

1 GE 4,310,156
73 C 4,310,157
81.3 4,310,158
108 4,310,159
149 R 4,310,160

CLASS 277

34 4,310,161
103 4,310,162
188 A 4,310,163
189 4,310,164
205 4,310,165

CLASS 280

5.28 4,310,166
4,310,167
11.24 4,310,168
12 K 4,310,169
636 4,310,170
688 4,310,171
703 4,310,172
704 4,310,173
731 4,310,174
801 4,310,175
4,310,176
802 4,310,177
4,310,178
803 4,310,179

CLASS 283

8 B 4,310,180

CLASS 285

4 4,310,181
40 4,310,182
114 4,310,183
238 4,310,184
369 4,310,185

CLASS 289

14 4,310,186

CLASS 290

1 C 4,310,768
54 4,310,769

CLASS 292

56 4,310,187
251.5 4,310,188

CLASS 294

19 A 4,310,189
147 4,310,190

CLASS 295

31 R 4,310,191

CLASS 296

1 S 4,310,192
75 4,310,193
159 4,310,194
173 4,310,195

CLASS 297

417 4,310,196

CLASS 299

11 4,310,197
39 4,310,198
76 4,310,199

CLASS 301

129 4,310,200

CLASS 303

110 4,310,201

CLASS 307

35 4,310,770
64 4,310,771

CLASS 308

6 C 4,310,202
9 4,310,203
4,310,204
135 4,310,205
187 4,310,206

CLASS 310

168 Re.30,847

CLASS 312

314 4,310,207

CLASS 313

113 4,310,772
180 4,310,781
221 4,310,773
228 4,310,774
271 4,310,782
345 4,310,777
346 R 4,310,775
371 4,310,778
407 4,310,779
412 4,310,780
414 4,310,776
474 4,310,783
4,310,784

CLASS 315

39.51 4,310,786
241 P 4,310,785

CLASS 318

85 4,310,787
551 4,310,788
587 4,310,789
608 4,310,790
800 4,310,791

CLASS 322

28 4,310,792
4,310,793

CLASS 324

61 R 4,310,794
78 D 4,310,795
4,310,800
209 4,310,798
220 4,310,796
228 4,310,797
319 4,310,799

CLASS 328

48 4,310,801
110 4,310,802
167 4,310,803

CLASS 331

1 A 4,310,804
4,310,805
40 4,310,806
65 4,310,807
94.5 C 4,310,808
117 D 4,310,809

CLASS 332

31 T 4,310,810

CLASS 333

1 4,310,811
81 A 4,310,812
117 4,310,813
121 4,310,814
138 4,310,815
156 4,310,816

CLASS 335

13 4,310,817
135 4,310,818
212 4,310,819
284 4,310,820

CLASS 336

200 4,310,821

CLASS 337

53 4,310,822

CLASS 338

2 4,310,823
174 4,310,824

CLASS 339

14 R 4,310,208
4,310,209
64 M 4,310,210
91 R 4,310,211
97 R 4,310,212
103 M 4,310,213
246 4,310,214

CLASS 340

52 F 4,310,825
58 4,310,826
146.3 E 4,310,827
310 A 4,310,829
347 AD 4,310,830
347 M 4,310,831
381 4,310,832
384 E 4,310,833
392 4,310,834
533 4,310,835
556 4,310,836
598 4,310,837
701 4,310,838
712 4,310,839
724 4,310,840
825.22 4,310,828
870.43 4,310,841

CLASS 343

5 PD 4,310,842
100 SA 4,310,843

CLASS 346

1.1 4,310,844
4,310,845
75 4,310,846

CLASS 350

1.5 4,310,215
3.72 4,310,216
96.16 4,310,217
96.21 4,310,218
321 4,310,219
357 4,310,220
431 4,310,221
432 4,310,222
465 4,310,223

CLASS 351

23 4,310,224
176 4,310,225

CLASS 354

5 4,310,226
25 4,310,227
33 4,310,228
43 4,310,229
50 4,310,230
79 4,310,231
125 4,310,232
212 4,310,233
298 4,310,234

CLASS 355

6 4,310,235
14 D 4,310,238
14 E 4,310,237
14 SH 4,310,236
18 4,310,239
54 4,310,240
60 4,310,241

CLASS 356

128 4,310,242
236 4,310,246
300 4,310,243
334 4,310,244
345 4,310,245
365 4,310,247
402 4,310,248
414 4,310,249
431 4,310,250
440 Re.30,845

CLASS 358

54 4,310,847
76 4,310,848
88 4,310,849
107 4,310,850
109 4,310,851
110 4,310,852
140 4,310,853
143 4,310,854
210 4,310,855
214 4,310,856
217 4,310,857
302 4,310,858
304 4,310,859

CLASS 360

40 4,310,860
50 4,310,861
68 4,310,862
90 4,310,863
97 4,310,864
106 4,310,865

CLASS 361

88 4,310,866
90 4,310,867
154 4,310,868
232 4,310,869
415 4,310,870

CLASS 362

23 4,310,871
82 4,310,872
100 4,310,873
251 4,310,874
277 4,310,875
298 4,310,876

CLASS 364

159 4,310,877
183 4,310,878
200 4,310,879
4,310,880
4,310,881
4,310,882
4,310,883
405 4,310,885
414 4,310,886
422 4,310,887
431.04 4,310,889
431.10 4,310,888
467 4,310,890
484 4,310,891
508 4,310,892
567 4,310,893
578 4,310,894
822 4,310,895
900 4,310,896

CLASS 365

1 4,310,897
6 4,310,898
113 4,310,899
190 4,310,900
200 4,310,901
218 4,310,902

CLASS 366

77 4,310,251
186 4,310,252
273 4,310,253

CLASS 367

11 4,310,907
102 4,310,903
131 4,310,904

140 4,310,905
181 4,310,906

CLASS 368

88 4,310,908
240 4,310,909

CLASS 369

43 4,310,912
4,310,913
4,310,914
45 4,310,911
109 4,310,916
116 4,310,910
170 4,310,917
215 4,310,918
251 4,310,915
275 4,310,919

CLASS 370

11 4,310,920
13 4,310,921
48 4,310,922

CLASS 376

280 4,310,385

CLASS 400

109 4,310,254
171 4,310,255
185 4,310,256
208 4,310,257
241.1 4,310,258

CLASS 401

265 4,310,259

CLASS 403

7 4,310,260

CLASS 404

117 4,310,261

CLASS 405

87 4,310,262
168 Re.30,846
169 4,310,263
172 4,310,264
227 4,310,265
259 4,310,266
283 4,310,267
294 4,310,268

CLASS 408

11 4,310,269
234 4,310,270

CLASS 410

13 4,310,271

CLASS 411

185 4,310,272
338 4,310,273

CLASS 413

12 4,309,952
18 4,309,951

CLASS 414

42 4,310,274
111 4,310,275
134 4,310,276
139 4,310,277
332 4,310,278
408 4,310,279
415 4,310,280
433 4,310,281
753 4,310,282
786 4,310,283

CLASS 416

132 B 4,310,284
134 R 4,310,285
198 A 4,310,286

CLASS 417

54 4,310,287
4,310,288
87 4,310,289
273 4,310,290
435 4,310,291

CLASS 422

68 4,310,487
102 4,310,488
110 4,310,489
135 4,310,493
188 4,310,490
234 4,310,491
246 4,310,492

CLASS 423

49 4,310,494
76 4,310,495
118 4,310,496
230 4,310,497
242 4,310,498
327 4,310,499
345 4,310,500
484 4,310,501
579 4,310,502
657 4,310,503

CLASS 424

1 4,310,504
4,310,505
4,310,506
4 4,310,507
12 4,310,508
28 4,310,509
45 4,310,510
59 4,310,511
76 4,310,512
80 4,310,513
88 4,310,514
131 4,310,515
145 4,310,516
177 4,310,517
4,310,518
181 4,310,519
200 4,310,520
232 4,310,521
236 4,310,522
240 4,310,523
244 4,310,524
4,310,525
248.55 4,310,526
249 4,310,551
251 4,310,527
262 4,310,528
263 4,310,529
4,310,530
4,310,531
4,310,589
267 4,310,532
4,310,533
4,310,534
270 4,310,590
273 R 4,310,535
274 4,310,538
281 4,310,536
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